

Canovision 8

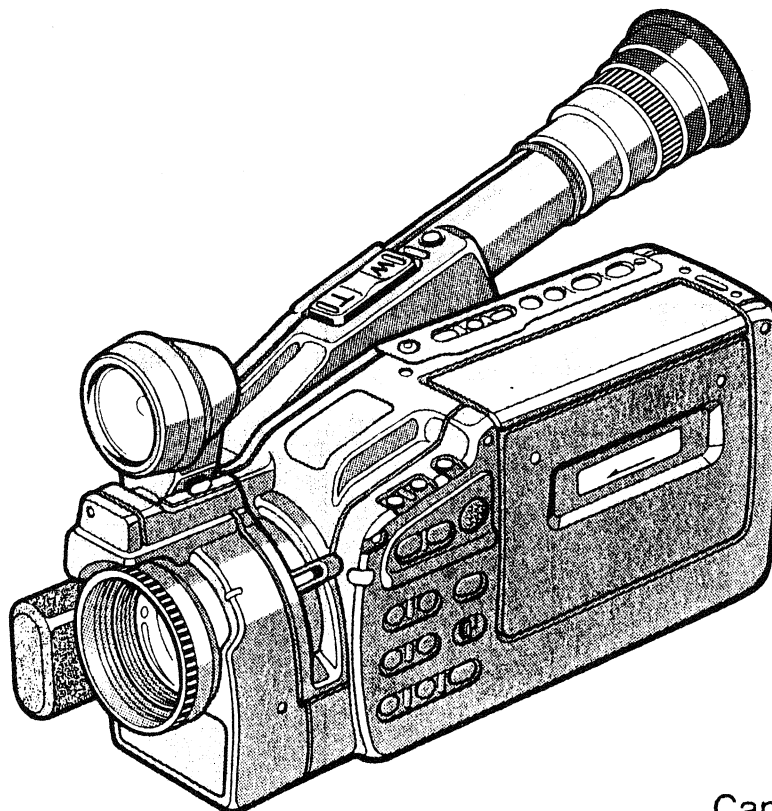
SERVICE MANUAL

E200E, E400E, E600E

(REF. NO. D15-5630, 6030, 6130)

8mm Video Camcorder

PAL



DY8-1155-630-000
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Canon Inc.
Video Technical Service Dept.
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SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.
Especially critical parts in the power circuit block should not be replaced with other makes.

Critical parts are marked with Δ in the schematic diagrams.

2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

- 1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and $5.2M\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

5-2 Leakage Current Hot Check

- 1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
- 2) Connect a $1.5K\Omega$ 10 watt resistor, paralleled by $0.15\mu F$ capacitor, between each exposed metallic parts on the unit and a good earth ground such as a water pipe, as shown in the figure below.
- 3) Use an AC voltmeter, with 1000Ω /volt or more sensitivity, to measure the potential across the resistor.
- 4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet. Screwheads, Metallic overlays, etc), and measure the voltage at each point.
- 5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
- 6) The potential at any point should not exceed 0.75V RMS.

A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.

Leakage current must not exceed 0.5 milliamp.

In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.

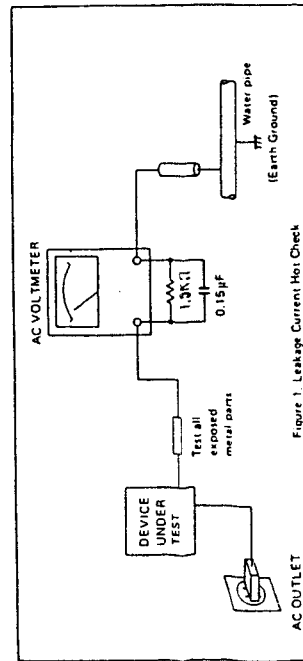


Figure 1 Leakage Current Hot Check

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CHAPTER I. GENERAL DESCRIPTION OF PRODUCT

1. Outline of Product

The models E200E, E400E and E600E are modified from the previous models E230E and E250E aiming to be used by beginners of videography.

1-1 Features

(1) High quality picture and sound

- * High performance zoom lens installed (8x for E200E, 10x for E400E, 12x for E600E)
- * High sensitivity and high performance, 1/3 inch 320,000 pixel CCD (image pickup device) installed. (E200E, E400E) (E600E is 1/3 inch 420,000 pixel CCD)
- * Newly developed compact mechanical chassis
- * 25 division evaluation AWB (Locking provided for the E400E and E600E)
- * Center-oriented average light measurement
- * Near infrared dual beam AF (E200E, E400E: 0.6 m \sim , E600E: 0.7 m \sim)
- * Y/C separation recording system
- * Hi-Fi stereo sound (E600E only)

(2) Functionalities

- * Sensitivity increasing function provided permits to shoot a dark object of approximately 2 lux.
- * Non-cord battery video light VL-7 standard provided (E200E only)
- * High speed shutter (1/4000 sec. for E200E, 1/10000 sec. for E400E, E600E)
- * High speed search (SP MODE: 15x speed, LP MODE: 30x speed)
- * AGE insert function interpreter (E400E, E600E only)
- * Reshooting function interpreter
- * REC search function interpreter

(3) Operability

- * EVF incorporating rotary grip
- * Wireless remote controller standard provided
- * Sports finder SF-200 standard provided
- * Linear time counter
- * External microphone terminal and headphone terminal. (E600E only)

1-2 Features of E200E, E400E, E600E

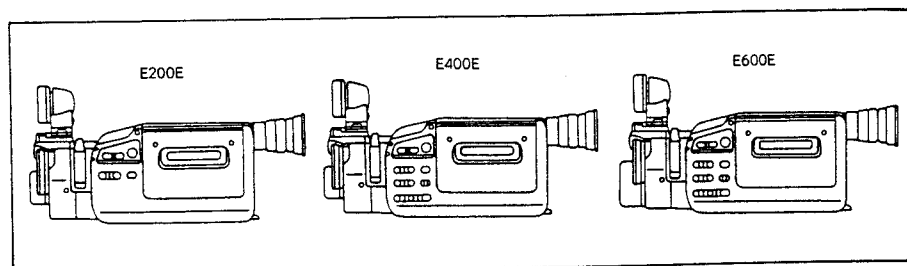


Table 1-1 Specification list

	E200E	E400E	E600E
Body color	Black	Black	Black
Dimensions WxHxD including hood (H+50 mm when attaching video light VL-7)	106,5 x 108 x 302 mm	106,5 x 108 x 302 mm	106,5 x 108 x 308 mm
Weight of main unit	Approx. 940 g	Approx. 950 g	Approx. 960 g
Lens zoom ratio, focal distance (converted to that of 1/2 inch lens)	8x, 7.0 to 56 mm (Approx. 9.3 to 74 mm)	10x, 6.7 to 67 mm (Approx. 9.0 to 90 mm)	12x, 6.7 to 80.4 mm (Approx. 9.0 to 108 mm)
High speed electronic shutter	1/4000, 1/1000, 1/60 sec.	1/10000, 1/4000, 1/2000, 1/1000, 1/500, 1/250, 1/60 sec.	1/10000, 1/4000, 1/2000, 1/1000, 1/500, 1/250, 1/60 sec.
Sound	Monoaural	Monoaural	Stereo
Video light VL-7	Adopted	Adopted	Adopted
CCD	1/3 inch, 320,000 pixels	1/3 inch, 320,000 pixels	1/3 inch, 420,000 pixels
Digital title	Impossible	Possible	Possible
AGE insert	Impossible	Possible	Possible

1-3 Features of different sections

Table 1-2 gives features of different sections of the product.

Table 1-2

Lens		Camera		Recorder		
Lens	AF	CCD	SENSOR, PROCESS	AUDIO-VIDEO	SYSCON-SERVO	Recorder mechanism
8x (E200E) 10x (E400E) 12x (E600E) New	Near infrared dual beam. AF	E200E, E400E: 1/3 inch 320,000 pixels. E600E: 1/3 inch 420,000 pixels. (New)	Sensor: H800HiE,F type Process: New IC. UC20E type	* Video: H800HiE,F, UC20E type * Audio E200E, E400E: E60E,F type E600E: UC20E type	A9E,F type	MC-4D (New)

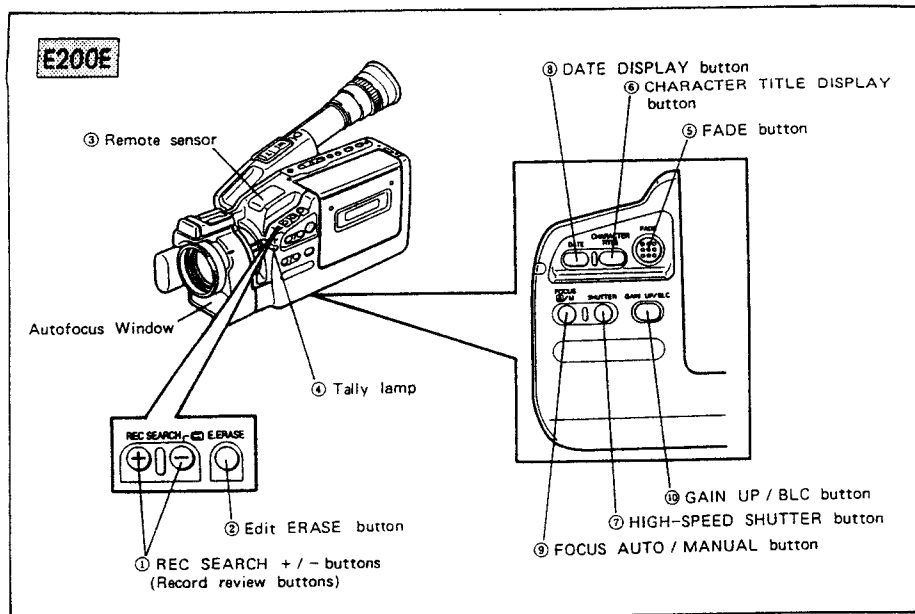


Fig. I-1

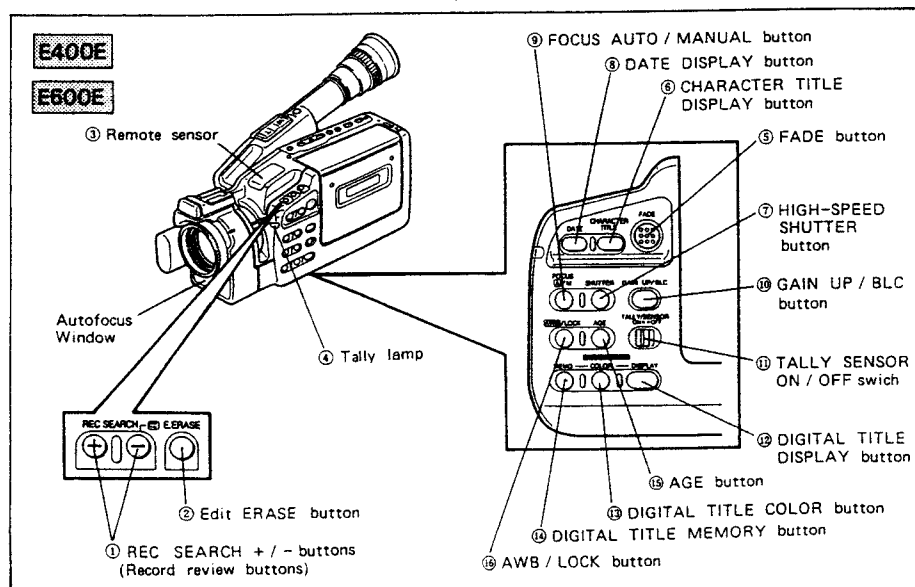


Fig. I-2

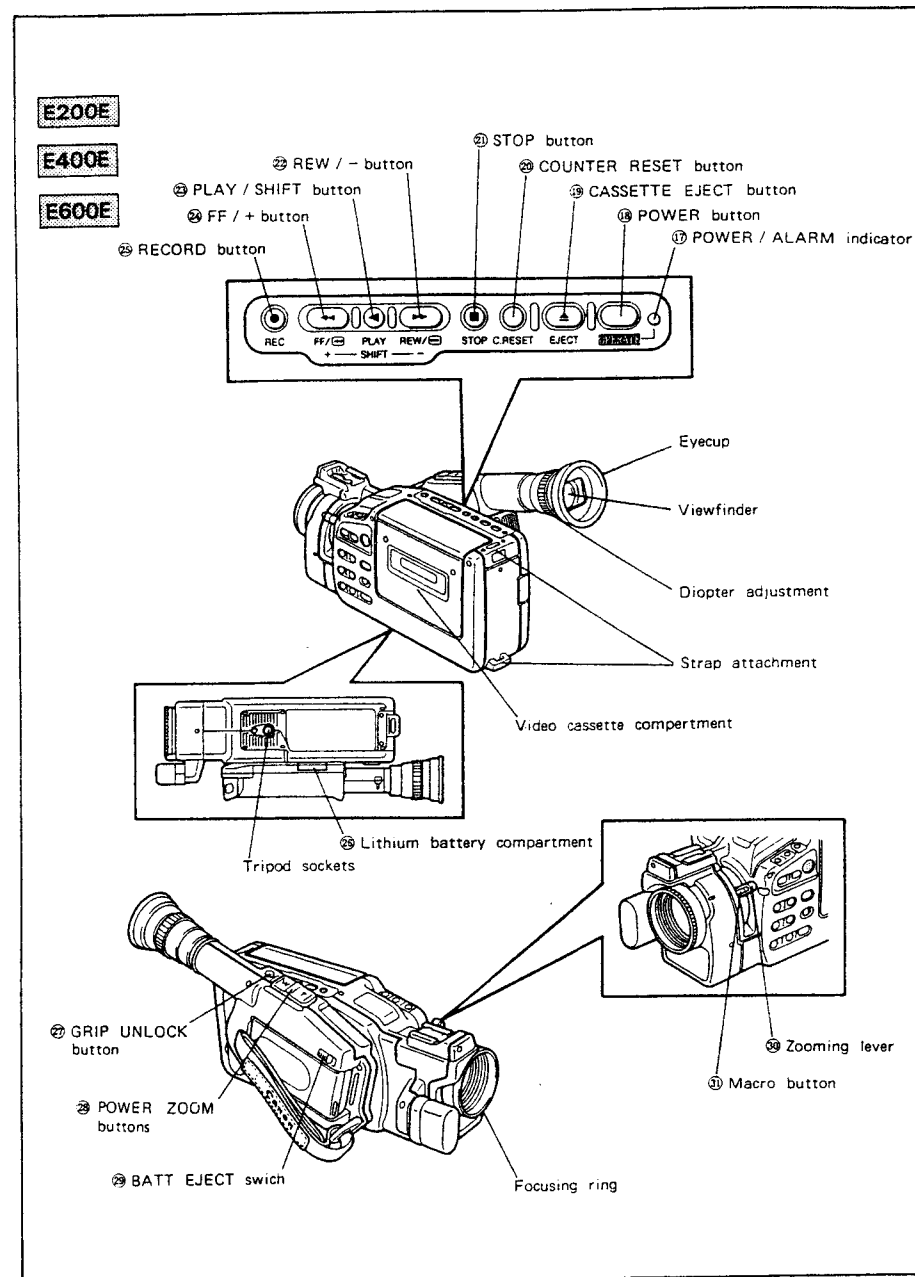


Fig. I-3

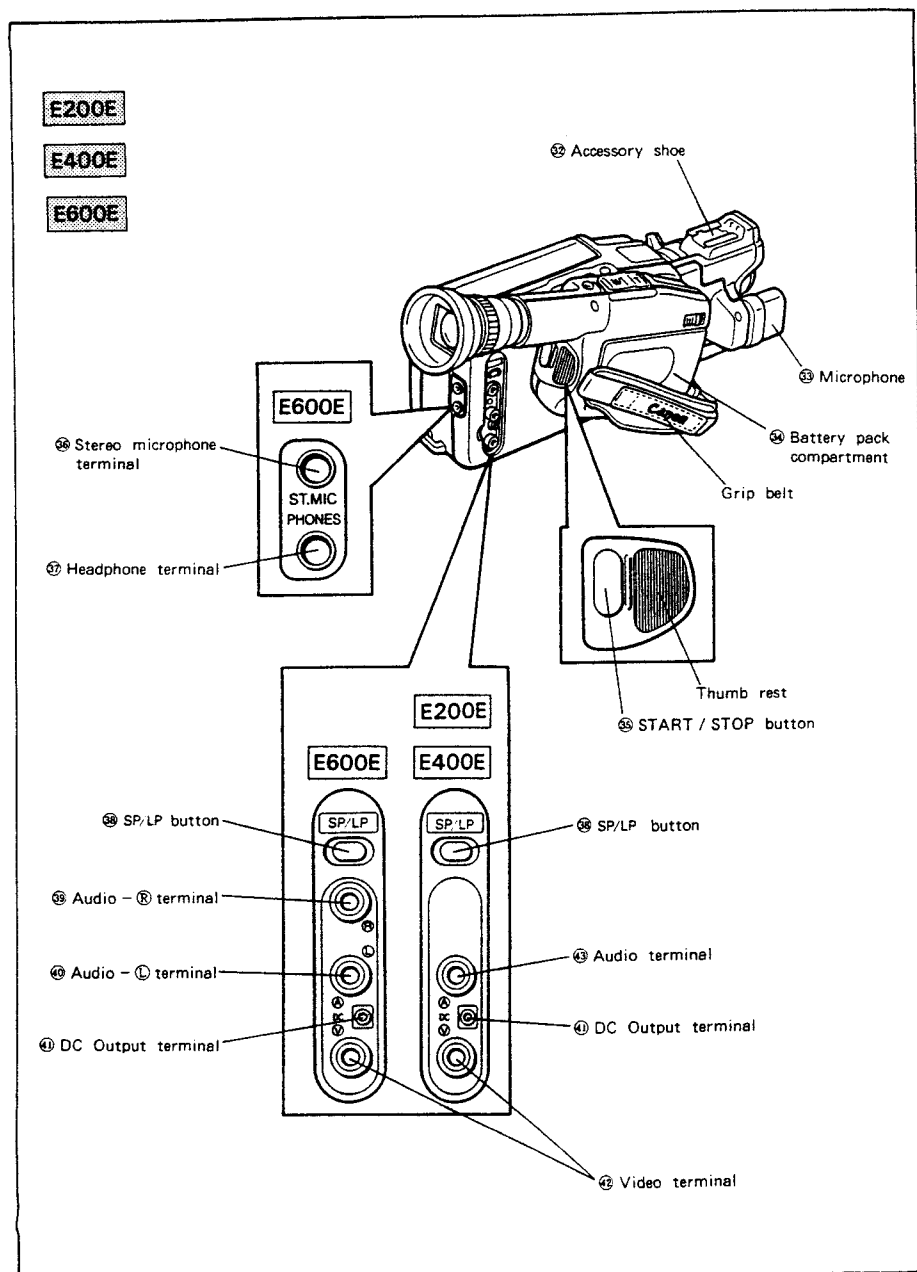


Fig. 1-4

1-5 Brief description of operating buttons

- ① REC SEARCH +/- (Record review) buttons
 Function as + button: In the recording pause state, a forward picture search can be made by holding down this button. Releasing it sets up the recording pause state again.
 Function as - button: In the recording pause state, a backward picture search can be made by holding down this button. Releasing it sets up the recording pause state again.

- ② Edit ERASE button
 When the recording is paused, press this button to rewind the tape to the beginning of the shot scene and stop recording.

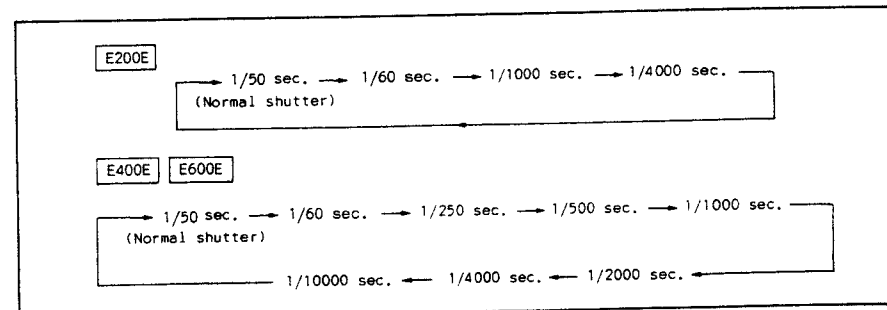
- ③ Remote sensor
 A signal from the remote controller is received through this window. The signal-receivable range is approximately 30 degrees on each of the right angular side and approximately 45 degrees on each of the left angular side and approximately 45 degrees on each of the upper angular side and approximately 0 degrees on each of the lower angular side. The maximum operation distance is 4 m.

- ④ TALLY LAMP
 The tally lamp flashes during camera recording operation. It lights up steadily when the remote control signal is received.

Camera recording operation ON for 0.5 sec., OFF for 0.5 sec
 Remote control signal received Lights up steadily.

- ⑤ FADE button
 In the CAMERA MODE, holding down fades out the image and sound, and releasing fades them in. (4 sec.) When fading is used. The button is not linked with the trigger button.
- ⑥ CHARACTER TITLE DISPLAY button
 Press to display or record an already prepared character title. Press again to cancel the display. Effective in other than the record search mode. Press and hold this switch for 3 sec. (approx.) to set the character title setting mode. Then, by manipulating + (24), - (22) and SHIFT (23) switches, a desired title can be created. After the title is created, push this button again for memory.

- ⑦ HIGH-SPEED SHUTTER button
 Pressing in camera mode makes the shutter speed change as follows.



⑧ DATE DISPLAY button

Turns on or off the date/time display. (Date/time cannot be displayed separately, but always together.)

Press and hold this switch for 3 sec. (approx.) to set the date setting mode. Then, by manipulating + (24), - (22) and SHIFT (23) switches, a desired date can be created. After the date is created, push this button again for memory.

⑨ FOCUS AUTO/MANUAL button

Every pressing alternately selects the auto or manual focus. At a manual focus, the EVF indicates "M.FOCUS".

⑩ GAIN UP/BLC (backlight compensation) button

Use this button for shooting in a dark room.

⑪ TALLY SENSOR ON/OFF switch (E400E, E600E only)

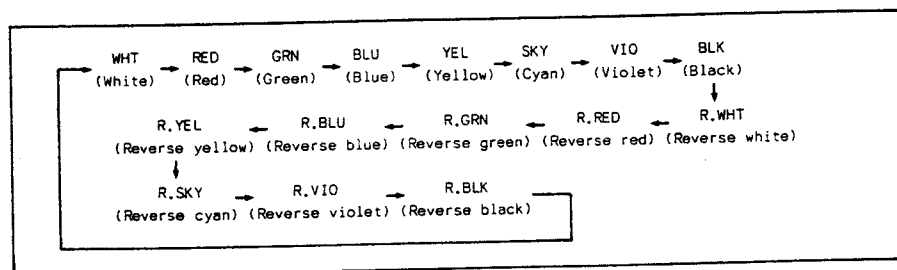
Should normally be set to ON. Set the switch to OFF to avoid reflection of a tally lamp as when shooting through glass.

⑫ DIGITAL TITLE DISPLAY button (E400E, E600E only)

Pressing this button superimposes a memorized digital title on the screen being videographed in the CAMERA mode, i.e. a digital title can be superimposed during camera recording.

⑬ DIGITAL TITLE COLOR button (E400E, E600E only)

The color of a digital image stored with the DIGITAL TITLE MEMORY button 4 can be changed using this button. Each press of this button changes the color of image (eight colors in each of non-reverse and reverse modes.)



⑭ DIGITAL TITLE MEMORY button (E400E, E600E only)

Pressing this button lets the internal memory store a digital image. Also, an image having insufficient or excessive contrast can be adjusted gradually for better contrast by holding down this button.

By pressing and holding down this button, the initial state can be changed for three times. In changing, the picture is displayed in monochrome.

⑮ AGE button (E400E, E600E only)

Pressing this button in CAMERA mode makes the memorized age display in the picture. Holding down for three seconds (approx.), the age setting mode can be set. (By using 24 (+), 23 (SHIFT) and 22 (-) buttons, the birth date can be memorized.) After setting, push this button again for fixing the value and displaying the age.

⑯ AWB/LOCK button (E400E, E600E only)

In the CAMERA mode, pressing this button toggles between the full-auto white balance state and the white balance lock state. When the white balance lock state is selected, "WB LOCK" is indicated on the viewfinder screen.

⑰ POWER/ALARM indicator

Under normal condition, this lamp lights up when the POWER switch is turned on. In the event of low battery voltage or moisture condensation, it flashes to give warning to the user.

⑱ POWER button

Used for turning power on/off.

⑲ CASSETTE EJECT button

In other than the recording mode, the video tape cassette can be ejected by pressing this button. Even in the power-off state, the cassette can be taken out.

⑳ COUNTER RESET (C.RESET) button

In any mode, pressing this button resets the linear tape counter to zero (0:00:00). When the tape cassette is loaded, the counter is reset automatically. This counter is capable of counting up/down to $\pm 4:15:59$.

㉑ STOP button (■)

Pressing this button causes tape drive to stop. (Pressing in recording mode causes the mode to PLAY.)

㉒ REW (⏮)/-button

Playback: Rewind button

Pressing this button in the stopped state rewinds the video tape. Holding it down in the playback mode reproduces pictures in the reverse sequence rapidly at a speed of 7x fast by holding down this button during rewinding, pictures can be reproduced in the reverse sequence rapidly at a speed of SP: 15x, LP: 30x fast motion.

Camera : - button

1) The date (year, month, day) and time (hours/minutes) can be set as desired using these buttons.

2) The birth date (year, month, day) can be set as desired. (E400E, E600E only)

4 : 45 PM	① 1992, 1993 ←-----→ 2010, 2011
④ ⑤ ④	② JAN. ←-----→ NOV., DEC.
14. JUL. 1992	③ 1.2.3.4 ←-----→ 29.30.31
③ ② ①	④ 1AM ←-----→ 11AM, 12PM, 1PM ←-----→ 11PM, 12AM
	⑤ 01.02.03 ←-----→ 58.59.00

* For the birth date setting, the ① to ③ only are usable.

3) The characters and digits of title can be selected as indicated below.

ABC← -- XYZA000AENÇ01 -- 89,./-'"':;?!*%

In the line input mode or during camera recording, it is not allowed to create a character title. (Camera recording is not allowed in the line input mode.)

23) **PLAY** (▶)/SHIFT button

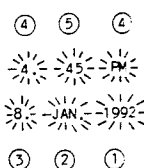
Playback: **Play** button

In other than the recording mode (CAMERA mode) and recording pause mode, pressing this button start the playback operation.

Camera : **SHIFT** button

1) In the auto date setting, "year", "month", "day", "hours" and "minutes" can be selected by pressing this button.

2) For the birth date setting, year, month, day can be changed. (E400E, E600E only)

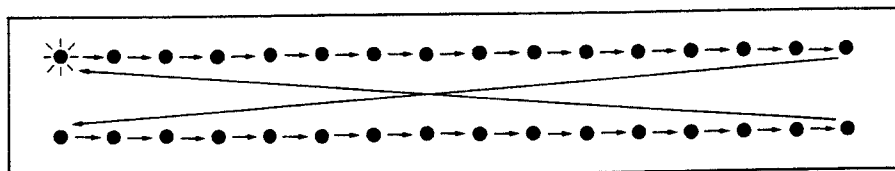


⑥ "Year", "month", "day", "hours" and "minutes" are all indicated.

* Displayed only on the viewfinder screen.

* For the birth date setting, the ① to ③ only are usable.

3) The title character position can be shifted using this button as indicated below. (16 characters x 2 lines)



24) **FF** (◀◀)/+ button

Playback: **Fast Forward** button

Pressing this button in the stopped state causes the video tape to be fed fast. And, holding it down in the playback mode reproduces pictures forward rapidly at a speed of 9x fast motion. When this button is released, the normal playback operation is resumed. Also, by holding down this button during fast-forwarding, pictures can be reproduced forward rapidly at a speed of SP: 15x, LP: 30x fast motion.

Camera : **+ button**

1) The date (year, month, day) and time (hours/minutes) can be set as desired using these buttons.

2) The birth date (year, month, day) can be set by this button. (E400E, E600E only)

3) The characters and digits of title can be selected as indicated below. In the line input mode or during camera recording, it is not allowed to create a character title. (Camera recording is not allowed in the line input mode.)

* The digits and characters in auto date, age and title settings are moved reversely the direction of arrows. (22) (REW/- button))

25) **RECORD** button

When this buttons is pressed in the stopped state or the still playback state, the camcorder is set to the recording pause state.

26) **Lithium battery compartment**

Contains the lithium battery for auto date function.

The lithium battery has a useful life of approx. one year.

27) **GRIP UNLOCK** button

Turn the multi-action grip while holding down this button, and release it at a favorable grip position. Thus, the multi-action grip can be set to the desired shooting angle.

28) **POWER ZOOM** button

With this button, the angle of view (frame) can be changed continuously in a range between the wide angle end and telephoto end. (E200E, E400E: 8 sec., E600E: 10 sec.)

29) **BATT** (Battery pack) **EJECT** switch

Slide this switch left to detach the battery pack from the battery box.

30) **Zooming lever**

Changes the frame (field angle). In the macro area, the lever sets the focus.

31) **Macro** button

At a close-up, press this button and bring the zoom lever to the macro area.

32) **Accessory shoe**

Video light VL-7 and other accessories are mounted. The video light can be lit at Record pause.

33) **Microphone**

E200E, E400E: Unidirectional monaural microphone (stationary)
E600E: Unidirectional stereophonic microphone
Microphone opening angle approximately 120°.

34) **Battery pack compartment**

Under its middle, there is a switch for detecting battery/car adapter. When using a battery, the video light can be lit.

35) **START/STOP** button

Pressing it at a recording pause status starts recording and pressing it again suspends recording.

- ③⑥ Stereo microphone terminal (ST.MIC) (E600E only)
Terminal for optional stereo microphone. Note that the external microphone DC plug must be connected to DC output terminal ④①.
- ③⑦ Headphone terminal (E600E only)
Headphone output terminal.
- ③⑧ SP/LP button
SP or LP recording mode is selectable at REC PAUSE, FF, REW or STOP mode.
- ③⑨ Audio-(R) terminal (E600E only)
Audio output terminal for stereophonic effect ((R))
- ④① Audio-(L) terminal (E600E only)
Audio output terminal for stereophonic and monaural effects ((L))
- ④① DC output terminal
+5V supply terminal for RF unit RU-100 and external microphone.
- ④② Video terminal
Video output terminal.
- ④③ Audio terminal (E200E, E400E only)
Audio monaural output terminal.

1-6 Information display on electronic viewfinder

For information display in the electronic viewfinder, a combination type is employed to ensure easy use. It indicates the camera and recorder operation modes, warning message, etc. and allows to select by one touch the auto date/title display mode or age insert mode.

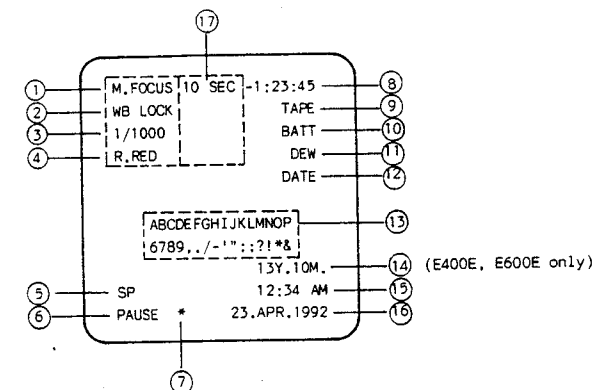


Table I-3 (1/2)

No.	Mode	Display	Description
①	Focus mode	No indication M.FOCUS	Auto focus mode Manual focus mode
②	White balance mode (E400E, E600E only)	No indication WB LOCK	Full auto white balance mode White balance lock mode
③	High speed shutter mode	<ul style="list-style-type: none"> o No indication o 1/60 • 1/250 • 1/500 o 1/1000 • 1/2000 • 1/4000 • 1/10000 	Normal shutter (1/50) Shutter speed 1/60 Shutter speed 1/250 Shutter speed 1/500 Shutter speed 1/1000 Shutter speed 1/2000 Shutter speed 1/4000 Shutter speed 1/10000
④	Digital title mode (E400E, E600E only)	WHT RED GRN BLU YEL SKY VIO BLK R.WHT ...	Normal title mode with 8 colors: White, red, green, blue, yellow, light blue, violet, BLACK. Reverse title mode indicated with R. 8 normal colors.

o: E200E only
•: E400E, E600E

Table 1-3 (2/2)

No.	Mode	Display	Description
⑤	SP/LP mode (Tape speed selection)	SP LP	Standard play Long play
⑥	Operation indication	No indication PAUSE REC PLAY STILL STOP FF REW EJECT EJECT (blink)	No indication during recording search. Indicated at recording pause. Indicated during recording. Indicated during playback, fast forward playback or reverse playback. Indicated during still playback. Indicated during stop. Indicated at fast forward. Indicated during rewinding. Indicated when taking out videocassette. Indicated when protective function is actuated.
⑦	Edit-Erase	*	Appears during the first minute or so of recording.
⑧	Count	-4:15:59 to 4:15:59	Indicates tape run time (hours, minutes, seconds). Reset to 0:00:00.
⑨	Tape	TAPE (blink) T.END	Indicated when video cassette is not installed or when record protected tape is installed in camera mode. Indicated when tape end is reached.
⑩	Battery	BATT (blink)	Indicated when battery pack voltage drops below certain level.
⑪	Condensation	DEW (blink)	Indicated if condensation occurs.
⑫	Lithium battery	DATE (blink)	Indicated if lithium battery voltage drops below certain level.
⑬	Title indication	16 columns x 2 lines	Title is indicated in A-Z, 0-9 and symbols. (A-Z, 0-9, ., /, -, " , ' , ! , * , &)
⑭	Age indication (E400E, E600E only)	OYIM to 99Y11M	Age indication. OY: 0-year, 1M: 1 month By setting the birth date (day, month, year), the current age is indicated.
⑮	Time indication	12:59 AM to 12:59 PM	Indicates current time.
⑯	Date indication	JAN. 1. 1992 to DEC. 31. 2010	Indicates current date in A.D.
	Birth date indication (E400E, E600E only)	1893.1.1 to 1992.12.31	Indicated when the AGE button is pressed for 3 seconds or more (approx.). The indication disappears by pushing again.
⑰	Timer indication	0 sec. to 10 sec.	Indicated for 10 seconds after starting shooting to notify shooting time.

1-7 E200E, E400E, E600E video system chart

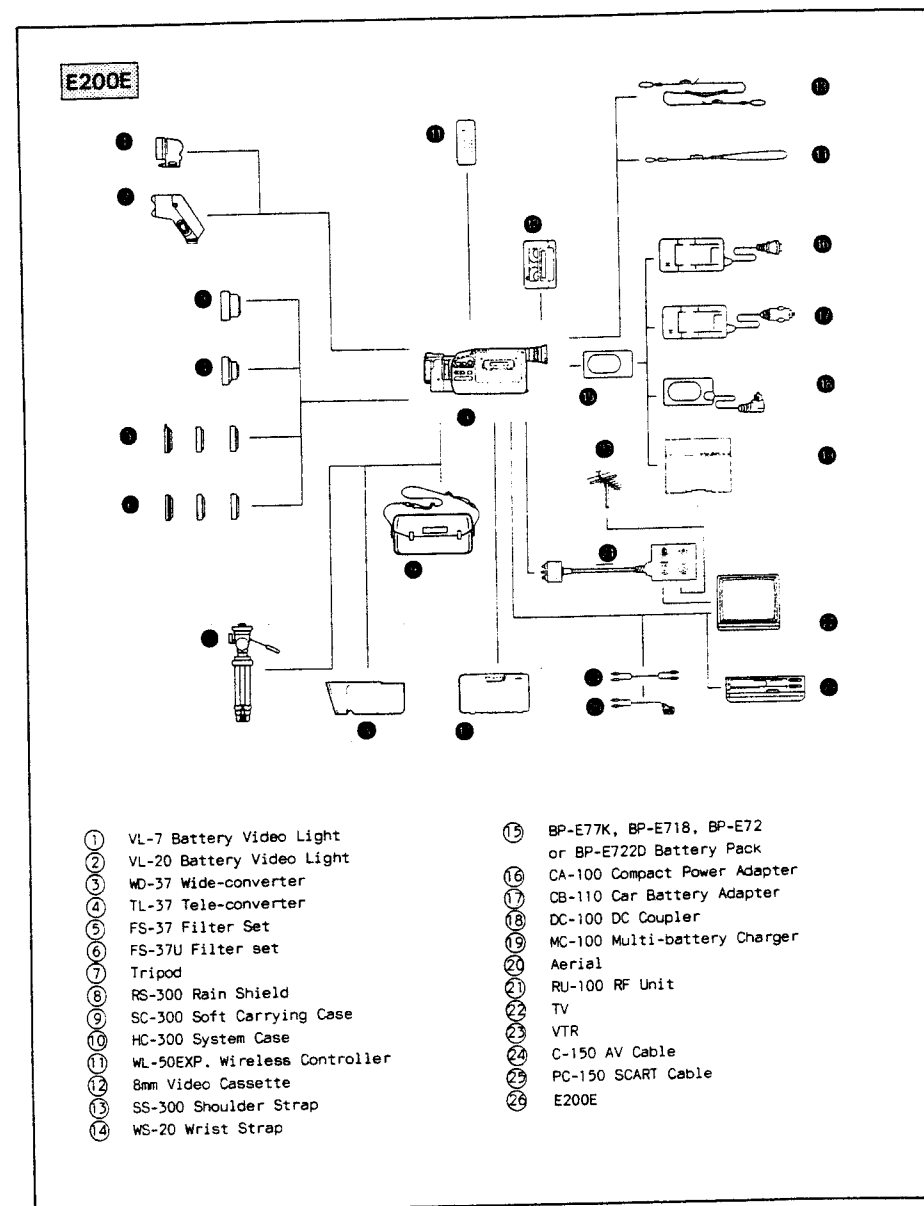


Fig. 1-5

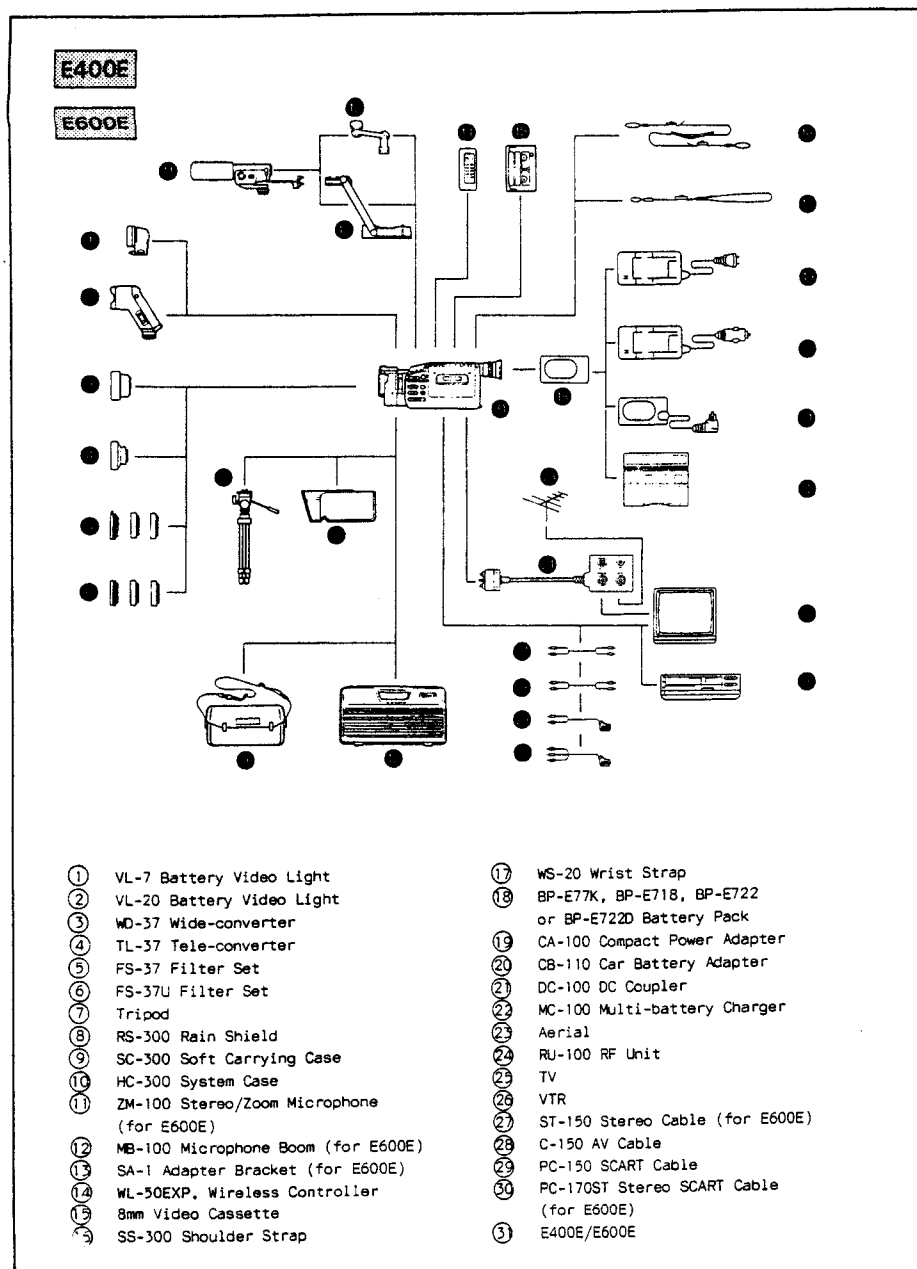


Fig. 1-6

2. New Technology

2-1 Compact, Light-Weight Mechanical Chassis (MC-4D)

The mechanical chassis with a two-head, an up-and-down slide loading mechanism and less number of components has been employed to reduce the weight. (The loading/unloading time gets longer a little.)

The following table shows the differences of specifications between the MC-4B (mounted on the A1, H660, etc.) and the MC-4D.

Table I-4 Specifications of MC-4B and MC-4D

	MC-4B (A1H1E,F, E640E,F etc.)	MC-4D (E200E, E400E, E600E)
Dimensions (H x W x D)	110.7 x 102.8 x 36.6	92.1 x 103.9 x 35.8
Weight (just a chassis)	265 g	250 g
Diameter of drum	40 mm	40 mm
Number of video head (Number of erase head)	2 pcs. (1 pc.)	2 pcs. (1 pc.)
Rotation of drum	25	25
High-speed search	20 times (approx.)	21 times (approx.)

The Capstan circuits which formerly equipped in the system control-servo section are mounted on the MC-4D.

For further details, refer to the service manual for the MC-4D separately issued.
(DY8-3391-505-201)

3. Circuit Board Configuration

- : Each elements (Diodes, transistors, ICs, etc.) are replaceable.
 — : Replace the AF block as a unit.
 : Replace each P.C.B. as a unit.

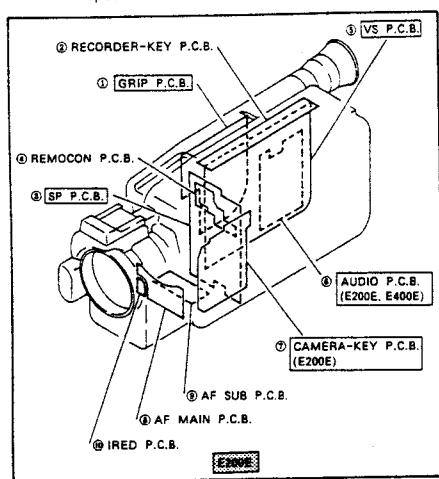


Fig. I-8

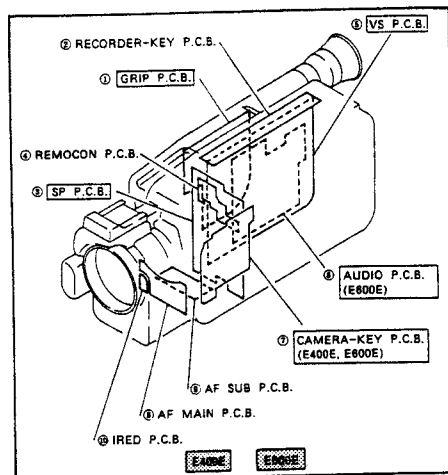


Fig. I-9

3-1 Outline of circuit boards

- ① GRIP P.C.B.
 - * Supplies power from the battery terminal to circuit boards. Fuses are provided.
 - * EVF drive circuit is provided. HD and VD are supplied as synchronizing signals to the character generator circuit.
- ② RECORDER-KEY P.C.B.
 - * A recorder key is installed.
- ③ SP P.C.B.
 - * SENSOR, PROCESS circuit board
 - * All CCD drive circuitry and camera signal processing circuitry are provided.
- ④ REMOCON P.C.B.
 - * Only a remote control beam detector element is provided.
- ⑤ VS P.C.B.
 - * VIDEO, SYSCON-SERVO circuit board.
 - * VIDEO signal processing (recording, playback, servo and system control, head amp circuits, title mix circuit.
- ⑥ AUDIO P.C.B.
 - * SP/LP SW
 - * Audio signal processing circuit, A/V terminal.
 - * Stereo (L)ch, (R)ch terminal. (E600E only)
- ⑦ CAMERA-KEY P.C.B.
 - * Character generator circuit. (E400E, E600E only)
 - * Camera key circuit.
- ⑧ AF MAIN P.C.B.
 - * AF infrared detector element, received infrared processing.
- ⑨ AF SUB P.C.B.
 - * Zoom motor drive circuit.
- ⑩ IRED P.C.B.
 - * AF infrared emission circuit board. DO NOT remove it because the circuit board position is adjusted. (For servicing, replace the AF block)

4. Circuit Description

4-1 Lens section

The AF system employed for the E200E, 400E, and E600E is similar to that for the conventional models E60E, E230E and E250E except the zooming which controlled by the AF-SUB P.C.B.

4-2 Camera section

The signal processing in the camera section is basically same as the UC10E's. (Refer to the Service Manual for the UC10E's). Hereafter, the operation of Power Supply Circuit and the function of each terminal in the camera microcomputer (IC1107) are explained.

4-2-1 Power supply circuit

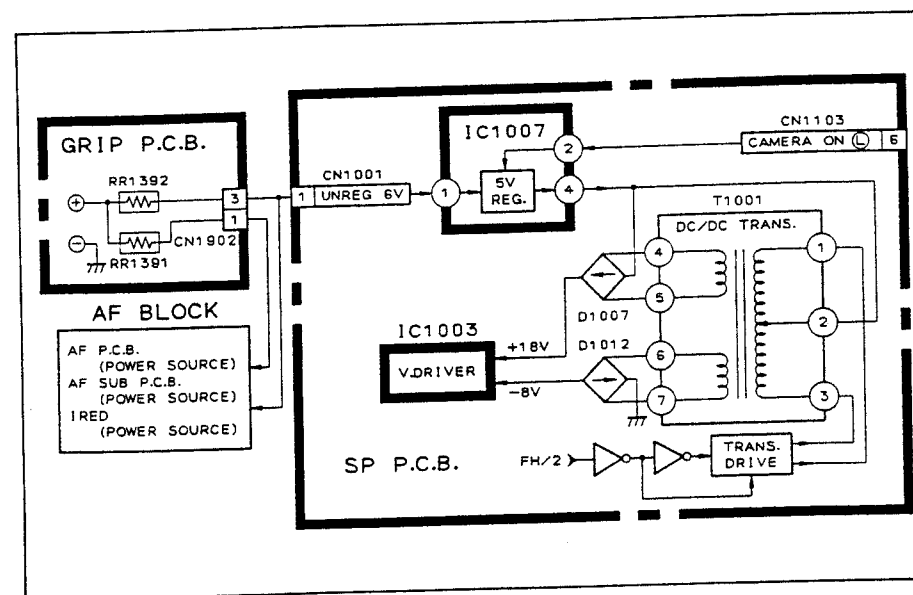


Fig. I-10

(1) Kinds of power supply

Each power source is generated and functional as follows.

UNREG.6V

The UNREG.6V is supplied from the GRIP P.C.B. to the SP P.C.B.

Camera 5V (+18V, -8V)

The UNREG.6V from the GRIP P.C.B. is fed to the 5V Regulator (IC1007) to be generated as the CAMERA 5V (main power source). Then, it is sent to the DC/DC converter to make the +18V and -8V (for driving the CCD).

Table I-5 (1/2)

Pin No.	Signal designation	I/O	Function																																								
1	CP2	I	Pulse generation sync signal input.																																								
2	-	-	Connected with ground.																																								
3	-	-	Connected with ground.																																								
4	-	-	Connected with ground.																																								
5	NC	O	Open.																																								
6	DM-CS	O	Chip select for serial communication with the digital IC1501.																																								
7	LDP2	O	Load pulse signal output for serial communication with the D/A converter (IC1102, 1103).																																								
8	LDP1																																										
9	SHUTTER 4		Shutter speed selection output. In normal recording at a shutter speed of 1/50 sec., all of these signals become 'Low'.																																								
10	SHUTTER 3																																										
11	SHUTTER 2																																										
12	SHUTTER 1																																										
<table><tr><th></th><th>1/60</th><th>1/250</th><th>1/500</th><th>1/1000</th><th>1/2000</th><th>1/4000</th><th>1/10000</th></tr><tr><td>SHUTTER 4</td><td>H</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td></tr><tr><td>SHUTTER 3</td><td>L</td><td>L</td><td>L</td><td>H</td><td>H</td><td>H</td><td>H</td></tr><tr><td>SHUTTER 2</td><td>L</td><td>H</td><td>H</td><td>L</td><td>L</td><td>H</td><td>H</td></tr><tr><td>SHUTTER 1</td><td>L</td><td>L</td><td>H</td><td>L</td><td>H</td><td>L</td><td>H</td></tr></table>					1/60	1/250	1/500	1/1000	1/2000	1/4000	1/10000	SHUTTER 4	H	L	L	L	L	L	L	SHUTTER 3	L	L	L	H	H	H	H	SHUTTER 2	L	H	H	L	L	H	H	SHUTTER 1	L	L	H	L	H	L	H
	1/60	1/250	1/500	1/1000	1/2000	1/4000	1/10000																																				
SHUTTER 4	H	L	L	L	L	L	L																																				
SHUTTER 3	L	L	L	H	H	H	H																																				
SHUTTER 2	L	H	H	L	L	H	H																																				
SHUTTER 1	L	L	H	L	H	L	H																																				
13	R-Y	I	R-Y signal input for auto white balance.																																								
14	AGC. V	I	Automatic gain control signal input.																																								
15	B-Y	I	B-Y signal input for auto white balance.																																								
16	V REF.	I	Reference voltage input (1.8 V).																																								
17	Y AGC	I	Y AGC signal input for auto knee control.																																								
18	-	I	Connected with ground.																																								
19	Y IRIS	I	Y IRIS input for backlight compensation.																																								
20	GND	I	Connected with ground.																																								
21	A/D REF (L)	I	Lower-limit voltage input for A/D conversion (ground).																																								
22	A/D REF (H)	I	Upper-limit voltage input for A/D conversion (+3.6 V).																																								
23	Vss	I	Connected with ground.																																								
24	-	-	Connected with ground.																																								
25	MODE B	I	Used for setting the microcomputer operation mode. This signal is always 'High'.																																								
26	-	I	Connected with ground.																																								
27	MODE A	I	Used for setting the microcomputer operation mode. This signal is always 'Low'.																																								
28	-	I	Connected with ground.																																								
29	NC	-	Open.																																								
30	-	-	Connected with ground.																																								
31	X OUT	O	Connected with the 12 MHz crystal oscillator.																																								
32	-	I	Connected with ground.																																								
33	X IN	I	Connected with the 12 MHz crystal oscillator.																																								
34	FCH MODE	I	Used for setting the function check mode for adjustment at the factory. This signal is always 'High'.																																								
35	-	I	Connected with ground.																																								
36	-	-	Connected with ground.																																								
37	ADJ MODE	I	The camera service mode is set up when this signal goes 'High'. Normal: Open.																																								
38	CAMERA REQ	O	Request signal for data communication with the camera microcomputer. Data communication is requested when this signal goes 'Low'.																																								
39	AF CONT	C	Switching terminal of power supply for AF circuit.																																								

Table I-5 (2/2)

Pin No.	Signal designation	I/O	Function
40	25 DIV RESET	I	25-division signal reset pulse. Resetting is made when the signal goes 'High'.
41	NC	-	Open.
42	-	-	Connected with ground.
43	RESET (L)	I	Microcomputer reset signal input.
44	-	I	Connected with ground.
45	-	I	For external interruption. Unused. Always 'High'.
46	-	-	Not used.
47	-	-	Not used.
48	-	I	Connected with ground.
49	Vss	I	Connected with ground.
50	-	-	Not used.
51	C-DATA	O	Main microcomputer data output.
52	C-DATA	I/O	Main microcomputer data input, and D/A converter data output.
53	CLOCK	I/O	Clock input/output for serial data communication.
54	CLOCK OUT (H)	I	Used for input/output selection of CLOCK at pin 53. This signal goes 'Low' for input and 'High' for output.
55	VDD	I	Connected with CAMERA 5V.
56	NC	-	Open.
57	I/O SELECT	O	I/O switch signal output for CLOCK at pin 53.
58	TELE (H)	O	Driving signal of zoom motor at telephoto area.
59	WIDE (H)	O	Driving signal of zoom motor at wide area.
60	-	I	Connected with ground.
61	-	-	Connected with ground.
62	25 DIV	O	Pulse for 25-division.
63	-	I	Connected with ground.
64	VD	I	Pulse generation sync signal input.

4-3 Recorder circuit operation

4-3-1 System control circuit

The system control is centered on the main microcomputer (IC108) and servo microcomputer (IC109).

The main microcomputer reads a key and determines the mode. According to it, the servo microcomputer controls the recorder mechanism and video signal system.

The E²PROM built in the camera microcomputer (IC1107) is used to store system parameters and power-save adjustment data. At power-on, the main microcomputer reads out these parameters and data through initial communication with the camera microcomputer. Serial data communication is carried out between the main microcomputer and the camera microcomputer.

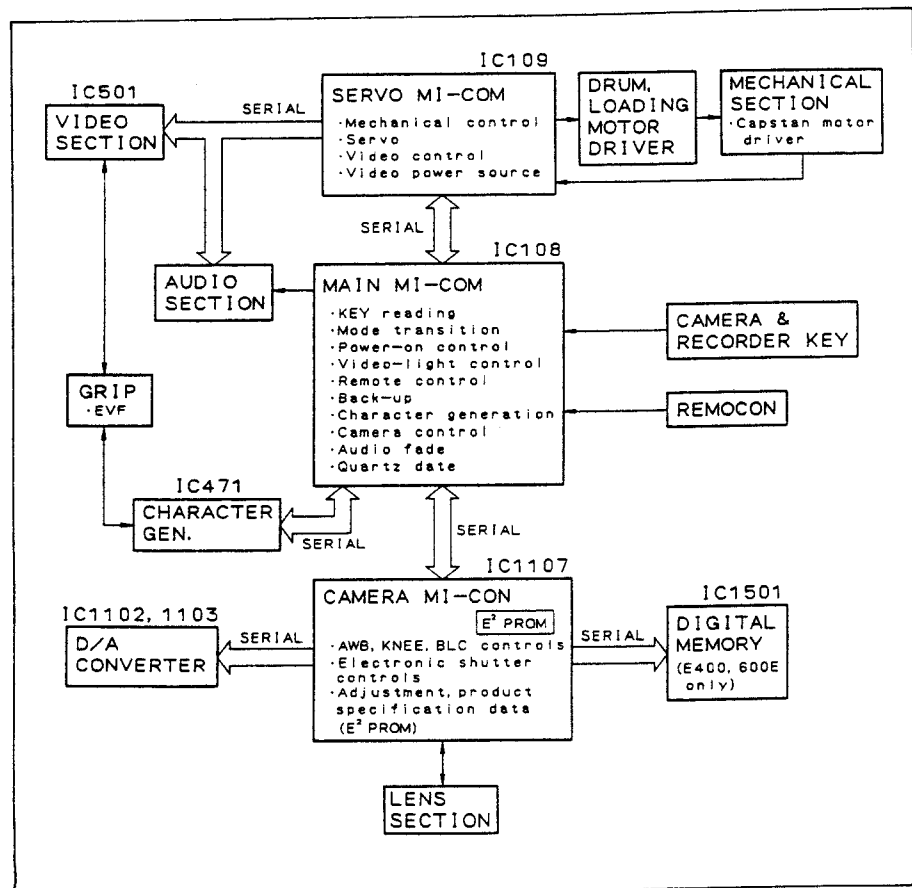


Fig. I-11

4-3-2 Power circuit

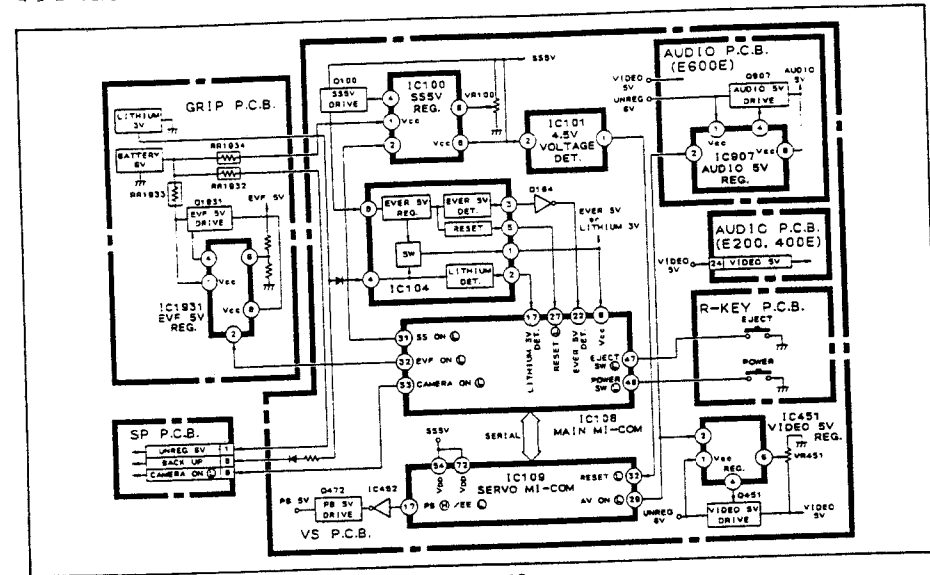


Fig. I-12

(1) Kinds of power source

The recorder section power is generated from UNREG 6V supplied from the battery terminal of GRIP P.C.B.

For auto date, age and digital title back up, a lithium battery supplies 3V.

EVER 5V

When power is supplied to the battery terminal, it is converted to 5V by EVER 5V regulator (IC104) on VS P.C.B. It is outputted so long as power is supplied and is mainly used for energizing the microcomputer.

SS 5V

When turning on the power SW, the main microcomputer (IC108) outputs SS ON (L) via pin 31, operates IC100 and Q100 and outputs SS 5V. It is used for energizing the servo system.

VIDEO 5V

When turning on the power SW, the servo microcomputer activated by SS 5V outputs AV ON (L) via pin 29, operates IC451 and Q451, and outputs VIDEO 5V. It is used for energizing the video system. (Also for audio system on the E200, 400E.)

AUDIO 5V (E600E only)

When turning on the power SW, the servo microcomputer activates IC907 and Q907 (AUDIO P.C.B.) by outputting AV ON (L) via pin 29, and the AUDIO 5V is output by this. It is used for the audio system.

EVF 5V

Turning on the power SW outputs EVF ON (L) from main microcomputer pin 32, operates IC1931 and Q1931 and outputs EVF 5V. It energizes EVF.

PB 5V

The PB 5 voltage is used as the power source for the JOG IC (IC476). It is output in playback mode. First, the PB high signal is output from the pin 17 of servo microcomputer. Then, it goes to the inverter and turns on the transistor 472. Then, at last, the PB 5 voltage is output from it.

Lithium 3V

The DC 3V (GRIP P.C.B.) from the lithium battery is used as a back-up voltage for the quartz date, AGE, digital title (E400, 600E only) when the main battery is not provided. (When provided, the EVER 5V is supplied for these operations.)

(2) Starting up power supply

• Resetting when installing power supply

When the power source is connected to the battery terminal, the EVER 5V is supplied from the VS P.C.B. to the main microcomputer via the pin 1 of IC104.

At the same time, the reset signal is output (reset at "L") via the pin 5 for resetting the main microcomputer. After reset, the main microcomputer enters the sleep mode for stand-by.

• Operation when turning on

When the power SW is turned on, the POWER SW (L) signal enters the main microcomputer to activate it. On receiving, the main microcomputer outputs the SS ON (L), CAMERA ON (L) and EVF ON (L) signals to activate each power source.

Then the Q100 is activated by the SS 5V Regulator (IC100) which received the SS ON (L) signal, and the SS 5V is output. The servo microcomputer starts operation by the RESET signal from the pin 1 of IC101 (which is supplied by detecting the SS 5V) for the communication with the main microcomputer. If request signals are detected from the servo microcomputer for 4 sec. or longer (approx.), power source is turned off.

On completion of data communication, the servo microcomputer outputs the AV ON (L) signal to output the VIDEO 5V.

• Operation when turning off

Pressing the power SW when power is turned on applies POWER SW (L) signal to the main microcomputer, which notifies POWER OFF to the servo microcomputer in serial data. The servo microcomputer turns the mechanism to the STOP mode, then notifies it to the main microcomputer in serial data and shuts down each power.

• Operation at power off eject

When the EJECT SW is pushed, the EJECT SW (L) signal enters the main microcomputer. By this, it outputs the SS ON (L) signal for resetting and restarting the servo microcomputer. After this operation, it is informed to the main microcomputer in serial data. Then, the power source is disconnected so that the main microcomputer enters the sleep mode.

(3) Resetting main microcomputer (IC104)

The main microcomputer uses the EVER 5V and the LITHIUM 3V as the power source as same as conventional models. Additionally, this model adopts the newly developed IC. When the LITHIUM 3V is supplied, the pin 1 of IC104 outputs no power without the connection with power source because the internal switching operation is performed. When the UNREG 6V is supplied, the EVER 5V is output from the pin 1 and the main microcomputer is reset simultaneously. Then, the 3V is output from the pin 1 if the LITHIUM 3V is supplied whenever the UNREG. 6V is not applied.

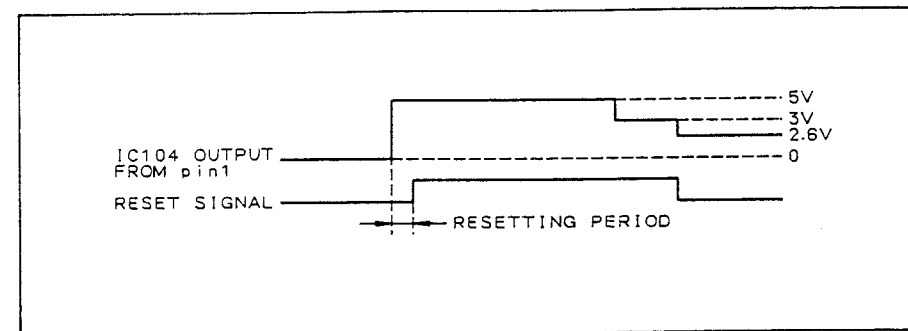


Fig. I-13

4-3-3 Terminal function of main microcomputer (IC108)

Table I-6 (1/2)

Pin No.	Signal designation	I/O	Function
1			
2	GND	-	Connected with GND.
3			
4	KEY 3	I	Camera key input.
5	KEY 2		
6	KEY 1	I	Recorder key input.
7	BATT. DET.	I	Battery voltage detecting terminal.
8	Vcc	I	EVER 5V
9			
2	-	-	Not used.
16			
17	LITHIUM 3V DET.	I	"L" input when lithium battery voltage drops to 2.7 V (approx.)
18	S-CLOCK	O	Clock output for serial communication with SERVO MI-COM, CHARACTER GEN., CAMERA MI-COM.
19	S-DATA	O	Data output for serial communication with SERVO MI-COM, CHARACTER GEN., CAMERA MI-COM.
20	S-DATA	I	Data input for serial communication with SERVO MI-COM, CAMERA MI-COM.
21	CASSETTE IN (L)	I	"L" when the cassette is down.
22	EVER 5V DET. (L)	I	"L" input at detection of EVER 5V.
23	X SUB IN	I	Sub clock oscillation pin. Connected to 32.768 kHz crystal.
24	X SUB OUT	O	
25	REMOCON	I	Transmit code input from remote controller.
26	Vss	-	Connected to GND.
27	RESET (L)	I	Main microcomputer reset signal input. Reset at "L" period.
28	X IN	I	Main clock oscillation pin. Connected to 8 MHz ceramic resonator.
29	X OUT	O	
30	Vss	-	Connected with GND.
31	SS ON (L)	O	SS 5V generator circuit ON/OFF control signal. ON at "L".
32	EVF ON (L)	O	EVF 5V generator circuit ON/OFF control signal. ON at "L".
33	CAMERA ON (L)	O	Camera power supply ON/OFF control signal. ON at "L".
34	LIGHT ON (L)	O	Video light power supply. ON permit signal output. Can be turned on at "L". Outputs "L" during REC PAUSE or REC.
35	TALLY (L)	O	Tally LED ON/OFF control. On at "L".
36	POWER LED (L)	O	Power LED ON/OFF control. On at "L".
37	CAMERA REQ	I	Communication request from camera microcomputer. Request at "L".
38	SERVO REQ	I	Communication request from servo microcomputer. Request at "L".
39	CAMERA CS	O	Camera microcomputer communication allowed at "H".
40	SERVO CS	O	Servo microcomputer communication allowed at "H".
41	CG-STROBE (H)	O	Character generator data select signal. Active "H".
42	NC	-	Open.
43	CG-BUSY (H)	I	Communication request signal for character generator "H" for communication.
44			
2	NC	-	Open.
46			
47	EJECT SW (L)	I	Eject SW input terminal.
48	POWER SW (L)	I	Power SW input terminal.

Table I-6 (2/2)

Pin No.	Signal designation	I/O	Function
49			
2	NC	-	Open.
55			
56	A-FADE 7		
2			
63	A-FADE 0	O	Audio fade signal. D/A conversion is made with an external resistor in fading. ("H" for fading.)
64			
2	GND	-	Connected with GND.
71			
72	NC	-	Open.
73	Vcc	I	EVER 5V
74	Vref		
75	Vss	-	Connected with GND.
76	WIDE SW (L)	I	Zoom wide switch input. "L" when switched on.
77	TELE SW (L)	I	Zoom tele switch input. "L" when switched on.
78	TRIG. SW (L)	I	Trigger switch input. "L" when switched on.
79	LINE SW (L)	I	Line switch input. "L" when switched on.
80	GND	-	Connected with GND.

4-3-4 Terminal functions of servo microcomputer (IC109)

Table I-7 (1/3)

Pin No.	Signal designation	I/O	Function
1	REC (H)	O	REC/PB switching control signal for head amp (IC401) and ATF IC (IC106).
2	HEAD SW PULSE	O	Head switching pulse output.
3	DRUM BRAKE (H)	O	When braking is applied to the drum motor, this signal goes "H".
4	DRUM FWD (L)	O	Forward/reverse drive select signal for the drum motor. When the drum motor is driven in the forward direction, this signal goes "L".
5	DRUM ON (H)	O	Drum motor on/off signal. This signal goes "H" when the drum motor turn on.
6	NC	-	Open.
7	CAMERA (H)	O	AV terminal input/output select signal. When the camera mode is selected, this signal goes "H".
8	REC SW	O	When the video signal in PCM area is cancelled in REC mode, this signal goes "H".
9			
2	NC	-	Open.
11			
12	A-MUTE (H)	O	Audio mute signal. For audio muting, this signal goes "H".
13	V-MUTE (H)	O	Video mute signal. For video muting, this signal goes "H".
14	VIDEO CS (L)	O	Chip select signal for serial data communication with the video IC (IC501). Serial data communication is carried out while this signal is "L".
15	SP (H)/ LP (L)	O	Not used.
16	NC	-	Open.
17	PB (H)/ EE (L)	O	When the playback mode is selected, this signal goes "H".

Table I-7 (2/3)

Pin No.	Signal designation	I/O	Function
18	JOG (H)	O	Time constant changeover signal for the RF AGC circuit. When the accelerated/decelerated playback operation is performed, this signal goes "H".
19	ACK	I	Inputs the Automatic Chrominance Killer signal
20	MODE SW 1	I	Inputs mechanical circuit position signals. (3-bit configuration)
21	MODE SW 2		
22	MODE SW 3		
23	BOT SENS.	I	This signal goes "L" when the beginning of the tape is detected and LED lights up.
24	EOT SENS.	I	This signal goes "L" when the end of the tape is detected and LED lights up.
25	TAPE SENS. LED	O	BOT/EOT detective LED control signal. This signal is used whether the beginning or end of tape is reached.
26	LMO LIMIT CONT.	O	Used to control the loading motor current limiter in the event of over loading. Goes "H" to turn on the limit current.
27	NC	-	Open
28	SS ON (L)	I	SERVO microcomputer start signal. (Not used)
29	AV ON (L)	O	VIDEO 5V, AUDIO 5V (E600E only) generator circuit ON/OFF control signal. ON at "L".
30	SERVO REQ	O	Outputs communication request signal to main microcomputer. Communicable during "L" period.
31	GND	-	Connected with GND.
32	RESET (L)	I	SERVO microcomputer reset signal input. Reset at "L" period.
33	GND	-	Connected with GND.
34	X OUT	O	Main clock oscillation pin. Connected to 8 MHz crystal.
35	X IN	I	
36	-	-	Connected with GND via resistor.
37	-	-	Connected with SS 5V.
38	V-DATA	O	Data output for serial communication with the video IC (IC501).
39	V-CLOCK	O	Clock output for serial communication with the video IC (IC501).
40	SERVO CS	I	Chip select signal for serial data communication with the main microcomputer. Communicable during "H" period.
41	S-DATA	I	Data input for serial communication with the main microcomputer.
42	S-DATA	O	Data output for serial communication with the main microcomputer.
43	S-CLOCK	I	Clock input for serial communication with the main microcomputer.
44	LMO LIMIT DET.	I	When loading motor is overcharged, it goes "L".
45	-	-	Connected with GND via resistor.
46	CH KEY	I	Used to function check in plant.
47	T-REEL FG	I	Takeup-reel FG input.
48	S-REEL FG	I	Supply-reel FG input.
49	DEW (H)	I	Dew (moisture condensation) sensor input.
50	ATF ERROR	I	ATF error input.
51	-	-	Connected with GND.
52	GND	-	Connected with GND.
53	Vref	-	Connected with SS 5V.
54	Vdd	-	Connected with SS 5V.

Table I-7 (3/3)

Pin No.	Signal designation	I/O	Function																				
55	REC PLOOF (L)	I	This signal becomes "L" when the safety tab of cassette is set to the write-inhibit position (for preventing unintentional erasure).																				
56	D-PG	I	Input terminal for drum PG signal.																				
57	CASSETTE IN (L)	I	"L" when the cassette is down.																				
58	C-SYNC	I	Sync signal input for rotation servo control.																				
59	ATF LOCK (L)	I	This signal goes "L" when the ATF phasing is locked normally in the ATF phase servo loop for playback.																				
60	-	-	Connected with SS 5V.																				
61	D-FG	I	Input terminal for drum FG signal.																				
62	C-FG	I	Input terminal for capstan FG signal.																				
63	UNLOAD	O	Loading motor control signal.																				
64	LOAD																						
<table><tr><td colspan="2">Operation</td><td>LOAD</td><td>UNLOAD</td><td>BRAKE</td></tr><tr><td>Signal</td><td></td><td></td><td></td><td></td></tr><tr><td>LOAD</td><td></td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td></td><td>L</td><td>H</td><td>H</td></tr></table>				Operation		LOAD	UNLOAD	BRAKE	Signal					LOAD		H	L	H	UNLOAD		L	H	H
Operation		LOAD	UNLOAD	BRAKE																			
Signal																							
LOAD		H	L	H																			
UNLOAD		L	H	H																			
65	CAPSTAN FWD (H)	O	Forward/reverse drive select signal for the capstan motor. When the capstan motor is driven in the forward direction, this signal goes "H".																				
66	CAPSTAN ON (H)	O	Capstan motor ON/OFF signal. This signal goes "H" when the capstan motor turn on.																				
67	C-PWM	O	PWM signal output for controlling the capstan motor.																				
68	D-PWM	O	PWM signal output for controlling the drum motor.																				
69	C-FG	I	Input terminal for capstan FG signal. (for driving the tape counter)																				
70	TEST	I	Test mode																				
71	SS 5V	I	Connected with SS 5V.																				
72	Vdd																						
73	Vss	-	Connected with GND.																				
74	-	-	Connected with SS 5V.																				
75	TS B	O	ATF error level hold B.																				
76	ATF SW	O	ATF BPF changeover signal. This signal goes "L" when an ATF error is detected on f1/f3 track, and it goes "H" when an ATF error is detected on f2/f4 track.																				
77	SEL 2	O	Used for controlling the frequencies of ATF PILOT signal.																				
78	SEL 1																						
<table><tr><td>PILOT</td><td>f1</td><td>f2</td><td>f3</td><td>f4</td></tr><tr><td>SEL 1</td><td>H</td><td>H</td><td>L</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>L</td><td>H</td><td>L</td></tr></table>				PILOT	f1	f2	f3	f4	SEL 1	H	H	L	L	SEL 2	H	L	H	L					
PILOT	f1	f2	f3	f4																			
SEL 1	H	H	L	L																			
SEL 2	H	L	H	L																			
79	JOG VD	O	Pseudo VD output inserted into the video signal in the accelerated/decelerated playback operation.																				
80	FE ON (H)	O	FE head turn-on control signal. This signal goes "H" for erasure.																				

4-3-5 Data communication

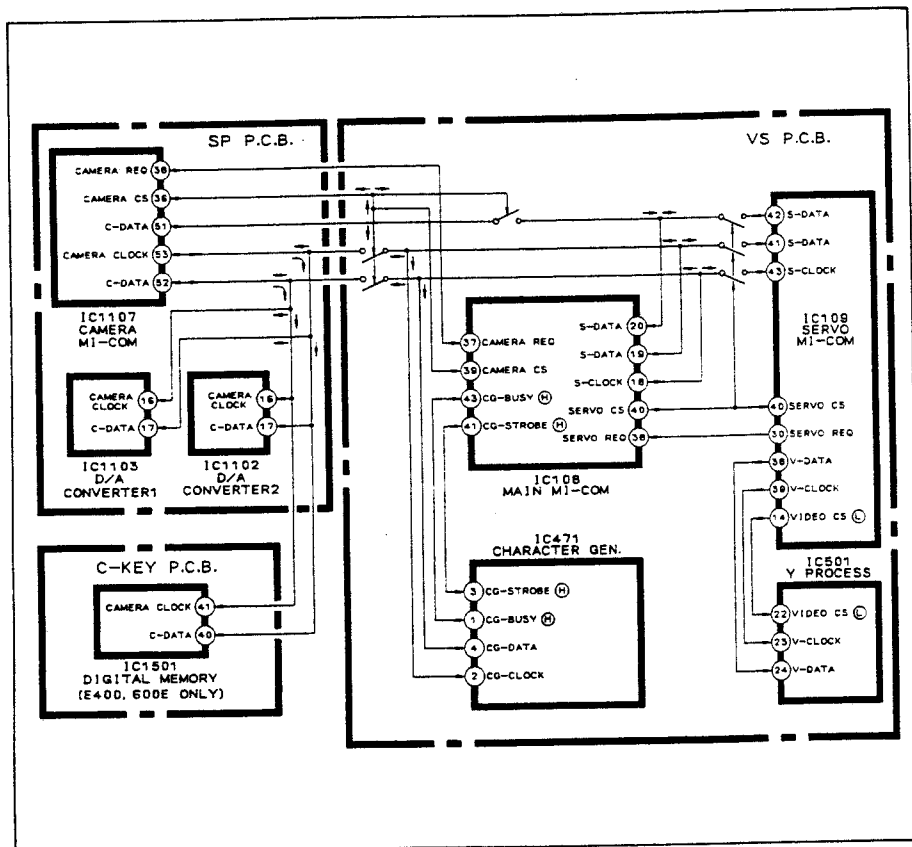


Fig. I-14

The data communication between microcomputer and IC is centered on the main microcomputer and is classified as follows.

Bi-directional communication

- * Main microcomputer ↔ Servo microcomputer
- * Main microcomputer ↔ Camera microcomputer
- * Main microcomputer ↔ Character gen.

Unidirectional communication

- * Camera microcomputer → D/A converter IC
- * Camera microcomputer → Digital memory IC (E200, 400E only)
- * Servo microcomputer → Video signal processing IC

As in conventional models, when the communication request signal is output to the main microcomputer (goes "L"), the chip select signal goes "L" for connecting the communication line, and the data is sent by synchronizing with the clock signal. After the data communication is terminated, the request signal goes "H" and the chip select "H" next.

4-3-6 Safety features

To avoid machine destruction, tape jamming, etc. attributable to anomalies of instrument, there are alarm display, key acceptance limit, operation limit and other safety features.

(1) Under-voltage detection

Under-voltage of main battery and lithium battery is detected by distinct circuits.

* Main battery

The operation when detecting under-voltage of main battery is divided into 3 steps according to the voltage.

(UNDER CUT 1)

When the battery terminal voltage is 5.65 V or lower, the power indicator LED blinks and "BATT" flashes in EVF to notify the battery voltage is too low.

In this mode, neither input keys nor operations are limited and the operation remains normal except that, once stopped, only the power SW or eject SW is operable.

(UNDER CUT 2)

If the battery voltage further drops below 5.45 V, the power is turned off via STOP mode.

(SHUT OFF)

If the battery voltage has abruptly changed and if EVER 5V drops below 4.5 V, RESET signal is output from pin 5 of IC104, resets the main microcomputers and immediately turns off power.

* Detector circuit

The UNREG. 6V power supplied from the main battery is divided through the resistor, and the divided voltage level is detected via pin 7 of the main microcomputer. Under condition that 5.65 V is present at the main battery terminal, the divided voltage level appearing at pin 7 is stored into the E²PROM built in the camera microcomputer. This divided voltage value is given to the main microcomputer through serial data communication. Comparing the stored voltage value with the voltage applied to pin 7, the main microcomputer detects 'UNDER CUT 1' or 'UNDER CUT 2' to take the power-saving sequence.

Note: UNDER CUT 1 or 2 is detected only when the status lasts 2 sec. or more.

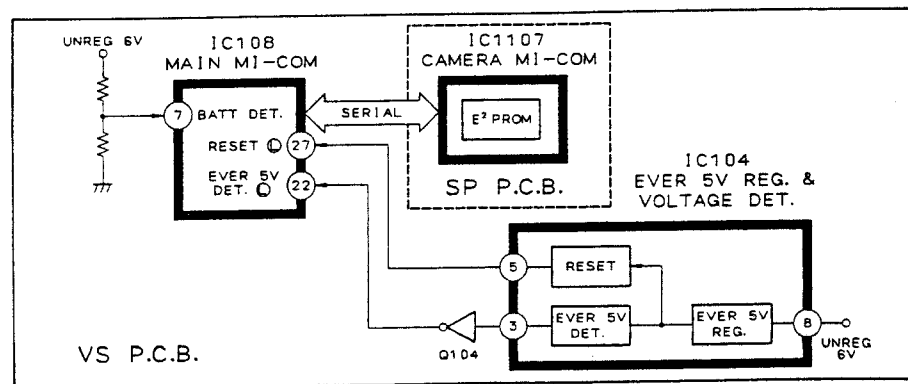


Fig. I-15

* Lithium battery

When the lithium battery terminal voltage drops below approximately 2.6 V, "DATE" blinks in E/F.

On VS P.C.B. IC104, if the voltage at pin 4 is below 2.6 V, pin 2 goes "L". The main microcomputer detects that "L" via pin 17 and sends a data so as to blink "DATE" to the character generator.

(Because a diode intervenes, the detection occurs at approximately 2.7 V in terms of lithium battery voltage.)

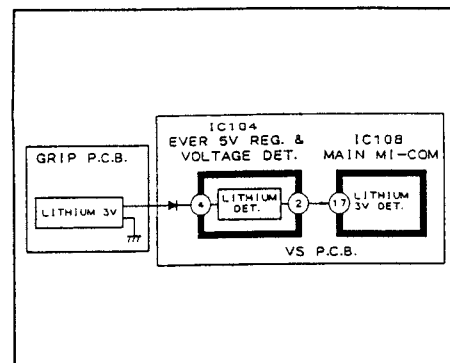


Fig. I-16

(2) Dew condensation

The dew (moisture condensation) detecting function is provided to circumvent jamming of tape due to possible sticking.

If moisture condensation is detected during operation, the mechanism performs the 'DEW EJECT' sequence to take the unload/cassette-in state. Under this condition, only the POWER and EJECT SWITCHES ARE EFFECTIVE. Even after clearing the dew condition, other keys are not accepted unless the power is turned off or the cassette is ejected. Also, even if the cassette is inserted under the dew condition, the loading sequence is not carried out.

For warning of the dew condition, the POWER LED indicator flashes and also 'DEW' and 'EJECT' blink on the viewfinder screen.

Under the dew condition, the dew sensor equipped on the recorder mechanical chassis increases its resistance to increase the DEW detection voltage input to pin 44 of the servo microcomputer. If the level of this voltage rises above the predetermined value, the microcomputer judges that dew condensation has occurred. Then, the microcomputer carries out the mode transition and provides warning indication.

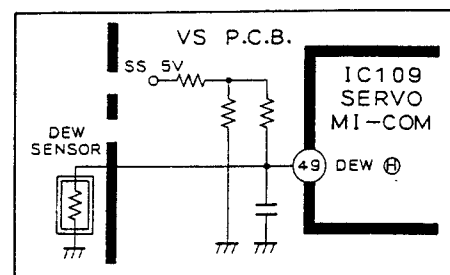


Fig. I-17

(3) Tape-end check

If the videotape is run up to its end, the tape guide may be damaged or the head drum may be squeezed with the tape. To prevent such an event, the end-of-tape check is conducted to detect the end of tape during operation. Upon detecting the end of tape, the tape is stopped immediately.

The LED for BOT/EOT detection is turned on/off by the TAPE SENS LED signal fed from the pin 25 of servo microcomputer (IC109). The flashing cycle is as shown in the Fig. I-18. If the signals at the timings of ①, ③ and ⑤, ⑦ in the figure are low, the mechanism cancels the detecting operation. (Judged as a light from the external)

Also, if the EOT and BOT input signals go 'Low' twice in succession, the microcomputer judges that the cassette is not loaded. In this case, 'TAPE' blinks on the viewfinder screen.

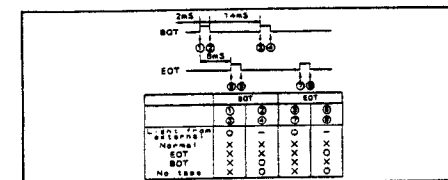


Fig. I-18

(4) Pause timer

In the REC PAUSE or STILL mode, the head drum rotates with the tape wound around it. If this condition persists for a certain period of time, the tape may wear or the head may be contaminated with magnetic oxides. To prevent this, if the REC PAUSE state is kept for seven minutes, it is automatically changed over to the STOP mode and the power is turned off. Also, if the STILL mode is kept for seven minutes, it is automatically changed over to the STOP mode with the power being turned on.

(5) Trouble stop (error)

Upon detection of an error, the SERVO microcomputer (IC401) puts the mechanism in the stop state. In this state, only the POWER and EJECT keys are usable. The error condition can then be reset. In the event of trouble, the POWER LED indicator flashes and 'EJECT' blinks on the viewfinder screen for warning.

Table I-8

Event	State	Detection
Drum error	1. Error detection state : At start/normal operation	Pin 61 of IC109 (D-FG)
	2. FG frequency at normal position: 300 Hz	
	3. Error detection level : 50% or less	
	4. Error detection period At start : 2 sec At normal operation : 0.5 sec	
Capstan error	1. Error detection state : At start/normal operation	Pin 62 of IC109 (C-FG)
	2. FG frequency at normal position: 1389 Hz	
	3. Error detection level : 9 to 12%	
	4. Error detection period At start : 1 sec At normal operation : 0.5 sec	
Reel error	1. Error detection state: At normal operation	Pins 47 and 48 of IC109 (47: Forwarding, T-REEL FG) (48: Reversing, S-REEL FG)
	2. Error detection level: More than 4734 C-FG pulses in half cycle of takeup/supply reel FG sequence. (Only on the side of takeup reel)	
	3. Error in ejecting : 2 grooves or less. (reel FG is checked)	
Loading error	1. Error detection state: At mode transition	Pin 62 of IC109 (C-FG)
	2. Error detection : Proper positioning not accomplished with a predetermined period of time	
Position No.		
1: EOT tape set	No. 1	2 sec.
2: Pop-up	No. 2	2 sec.
3: Eject	No. 3	2 sec.
4: Load	No. 4	4 sec.
5: Stop	No. 5	2 sec.
6: Turn	No. 6	2 sec.
7: Play	No. 7	2 sec.
8: FF	No. 8	2 sec.

< Processing after error detection >

Table I-9

	CASSETTE IN	LOADING in progress	LOADING in progress	UNLOADING in progress	POP-UP in progress	TAPE RUNNING	MODE TRANSITION in progress	DEW EJECT in progress	ERROR STOP 1 in progress
Drum error	POP-UP	POP-UP	ERROR STOP 1	POP-UP	POP-UP	ERROR STOP 1	ERROR STOP 1	-	ERROR STOP 2
Capstan error	POP-UP	-	ERROR STOP 1	ERROR STOP 1	-	ERROR STOP 1	ERROR STOP 1	ERROR STOP 1	ERROR STOP 2
Reel error	-	-	-	ERROR STOP 1	-	ERROR STOP 1	ERROR STOP 1	ERROR STOP 1	-
Loading error	POP-UP	POP-UP	ERROR STOP 1	ERROR STOP 1	POP-UP	-	ERROR STOP 1	ERROR STOP 1	ERROR STOP 2

* POP-UP : Error indication → DEW Eject → POP-UP → Error clear

* ERROR STOP 1 : Error indication → Stop position (Error indication is not cleared unless the power off or cassette is ejected.

* ERROR STOP 2 : Error indication → Stopped (Error indication is not cleared unless the power ON/OFF or cassette is ejected.

(6) Power-On

When the power is turned on, the servo microcomputer checks the mechanism's position by signals from pins 20, 21 and 22. If the mechanism positioned other than the EJECT or STOP position (normal positions), the loading motor is forwarded (or reversely rotated) to set it to normal position. The loading motor is forwarded for 2 sec. to find the position. (from 1 through 8 in Table I-10) If the position cannot be found, it will be reversely rotated for 2 sec. The "Loading error" is judged if the position cannot be found by these operations.

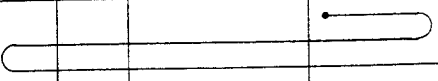
Table I-10

Mechanism position	Operation
1 EOT tape set	Loading motor forwarded → EJECT
2 POP-UP	Loading motor forwarded → EJECT
3 EJECT	→ EJECT
4 LOAD	Loading motor forwarded → STOP
5 STOP	→ STOP
6 TURN	Loading motor reversed → STOP
7 PLAY	Loading motor reversed → STOP
8 FF	Loading motor reversed → STOP

(7) Full-end loading

To make loading of EOT tape without damaging the tape guide (this mechanism makes loading by S-reel for normal tape), if the EOT tape is inserted, the mechanism is transferred to the EOT tape set position. Here, the T hard braking is cancelled to make loading by the T reel. The tape is ejected because the EJECT position is programmed before the EOT tape set position, however, by setting the cassette compartment down, the loading can be made.

Table I-11

Position	EOT tape set (Hard brake released)	POP-UP	EJECT (Cassette compart- ment upped)	LOAD (EOT detected)	STOP	TURN	PLAY	FF
Full-end Loading Mech. position								

CHAPTER II. DISASSEMBLING/ADJUSTMENTS

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CHAPTER II. DISASSEMBLING/ADJUSTMENTS

1. Before Disassembling/Adjustments

1-1 List of maintenance tools and supplies

1-1-1 Maintenance tools

Table II-1

DESCRIPTION	TOOL NO.	REMARKS
Alignment tape E (Monosco)	DY9-1062-000	
Alignment tape (STEREO)	DY9-1292-500	
Extension cable	DY9-1268-000	New
Extension cable	DY9-1267-000	New
Extension cable	DG1-1821-000	New
Extension cable	DY9-1203-000	New
Extension cable	DY9-1282-000	New
Extension cable	DY9-1173-000	
Extension cable	DY9-1251-000	
Extension cable	DY9-1255-000	
Extension cable	DY9-1191-000	E400, 600E only
Y/C Separator	DY9-1093-500	
Color bar chart	DY9-2002-000	
Gray scale chart	DY9-2005-000	
Color chart viewer (5600°K)	DY9-2039-500-220	Europe (except U.K.), H.K., etc.
	DY9-2039-500-240	U.K. only
Viewer lamp (5600°K)	DY9-2040-000	
CCA 12 filter (46 mm in diameter)	DY9-2046-000	
Character generator	DY9-1115-000	
Holder, Adjuster II	DY9-2050-000	
Bit, Adjuster II (0.9 mm)	DY9-2050-001	
Bit, Adjuster II (1.3 mm)	DY9-2050-002	
Bit, Adjuster II (1.8 mm)	DY9-2050-003	
Bit, Adjuster II (2.6 mm)	DY9-2050-004	

1-1-2 Supplies

Table II-2

DESCRIPTION	TOOL NO.	REMARKS
Grease GE-X8	CY9-8044-000	
Grease GE-C9	CY9-8043-000	
Grease GE-C4	CY9-8045-000	
Tefron fluorocarbon resin MP102	DY9-3013-000	
Alonalpha	DY9-8007-000	
Floil G902	DY9-3017-000	
Floil G741B	DY9-3021-000	E600E only

* Note: For mechanical adjustments of the recorder section, refer to the manual for the MC-4D mechanical chassis (DY8-3391-505 201) separately issued.

1-2 List of extension cables

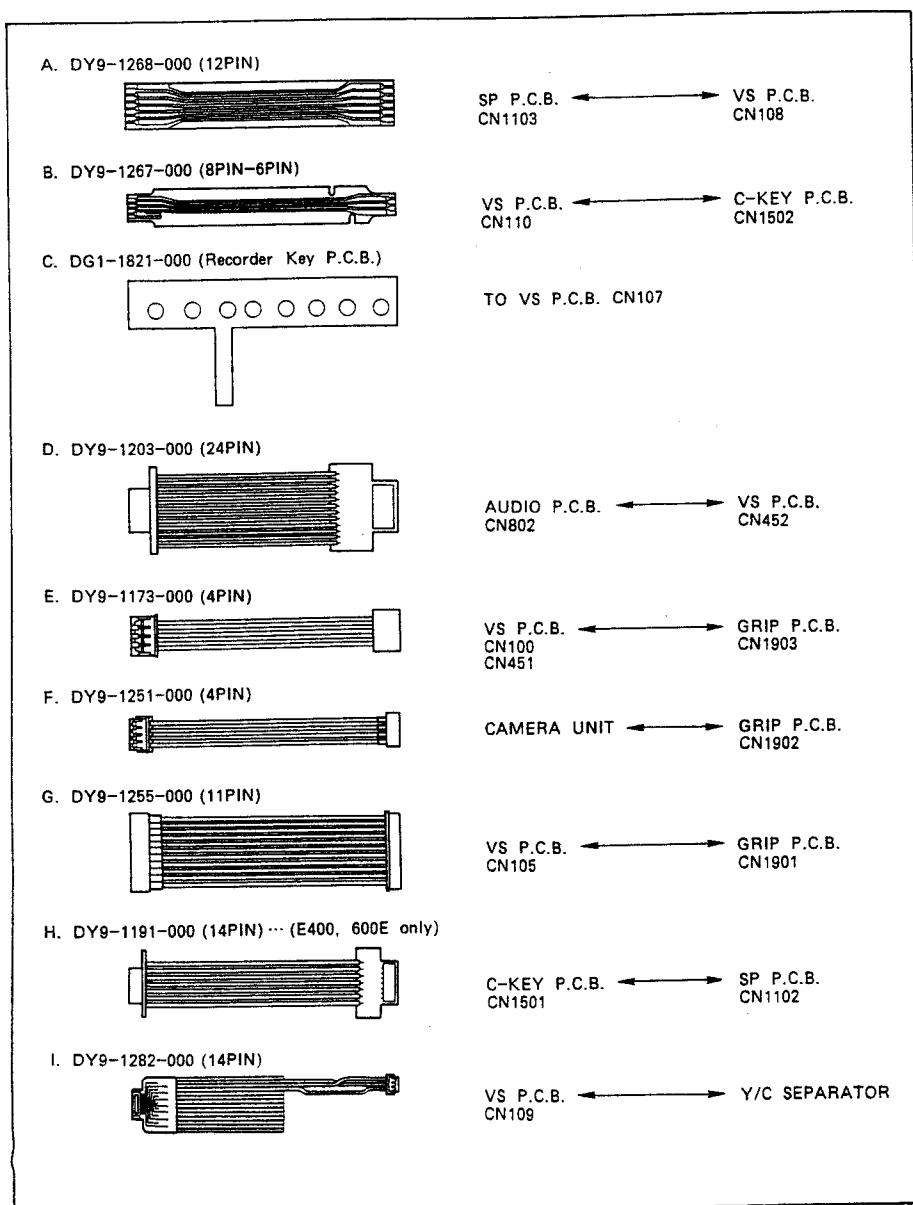


Fig. II-1

2. Disassembling

2-1 Disassembling of covers

2-1-1 Removal of lithium battery and connector cap

- (1) Turn the grip slantwise, and remove the lithium battery in the arrow direction.
- (2) Remove the connector cap.

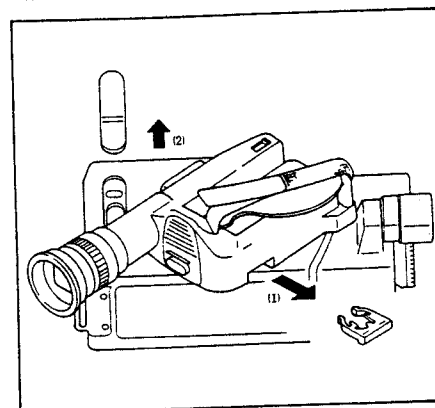


Fig. II-2

2-1-2 Removal of cassette cover and LS cover

- (1) Remove two screw (a)s, and remove the cassette cover.
- (2) Remove two screw (b)s, and remove the LS cover.

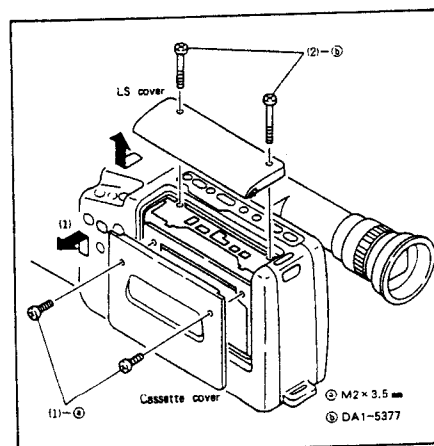


Fig. II-3

2-1-3 Removal of finder, EVF ring, and grip left cover

- (1) Remove the finder and the EVF ring.
- (2) Remove five screw (c)s, and remove the grip left cover.

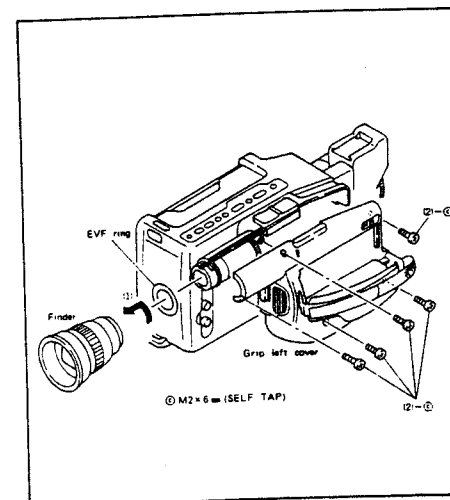


Fig. II-4

2-1-4 Removal of lens hood and lens cover

- (1) Remove the lens hood while turning it in the direction of arrow.
- (2) Remove two screw (d)s, (e) and (f).
- (3) Remove the lens cover.

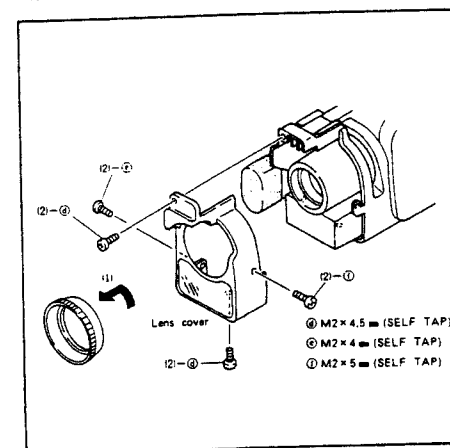


Fig. II-5

2-1-5 Removal of connectors of GRIP P.C.B.

- (1) Unplug four connectors (CNs 1901, 1902, 1903 and 1904) between the GRIP P.C.B. and the main unit.

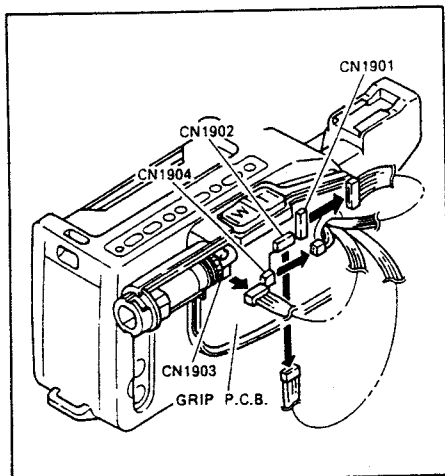


Fig. II-6

2-1-6 Removal of right, left and upper covers (Part I)

- (1) Remove four screw (d)s and two (g)s.
- (2) Remove two screw (a)s and (f).

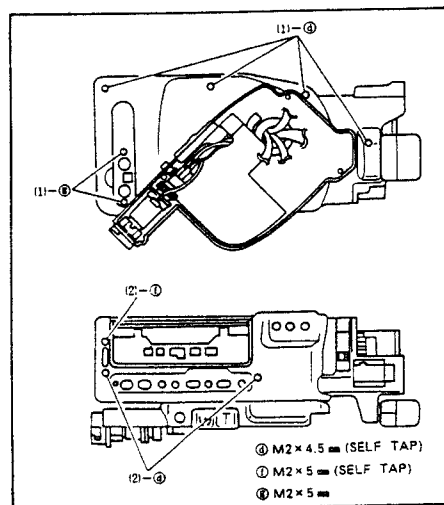


Fig. II-7

2-1-7 Removal of left, right, upper covers and microphone unit (Part II)

- (1) Remove two screw (d)s.
- (2) Remove the screw (f).
- (3) Remove three screw (a)s and (f).
- (4) Remove the left, right covers and the tally key. (E400, 600E only)
Unplug the CN801, and remove the microphone unit and the upper cover.

* Note: Remove the left cover while taking out the connector through the hole.

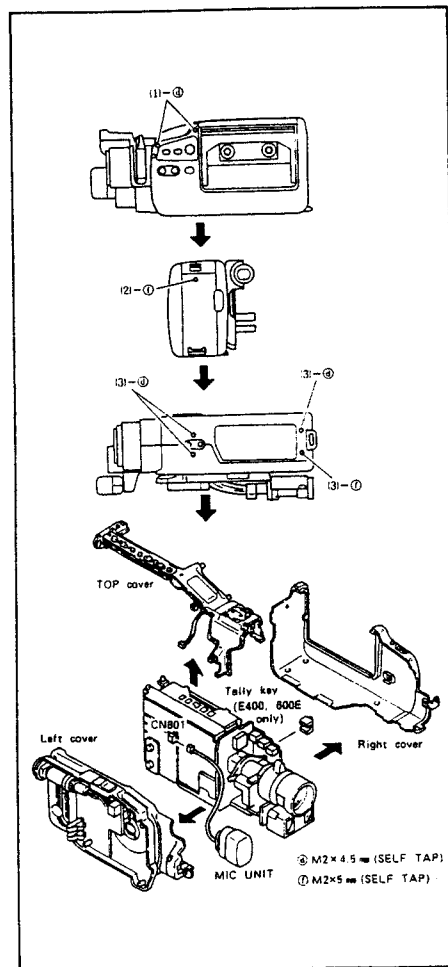


Fig. II-8

2-1-8 Separation of camera and recorder units (Part I)

- (1) Remove the screw (h).
- (2) Unplug the CN1502.

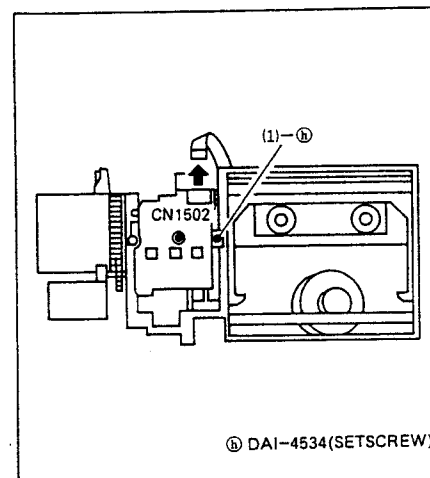


Fig. II-9

2-1-9 Separation of camera and recorder units (Part II)

- (1) Unplug the CN1103.
- (2) Separate the camera unit from the recorder unit.

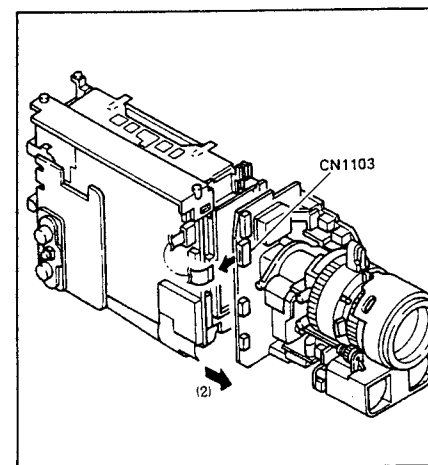


Fig. II-10

2-1-10 Removal of GRIP P.C.B.

- (1) Remove the screw (d).
- (2) Remove the GRIP P.C.B. by disengaging the claw part (A).

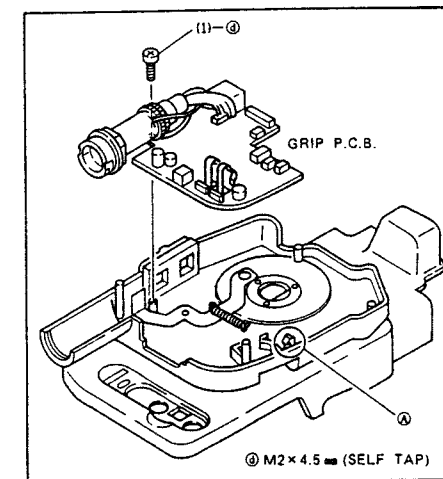


Fig. II-11

2-1-11 Removal of grip right cover

- (1) Remove three screw (i)s.
- (2) Remove the grip right cover.

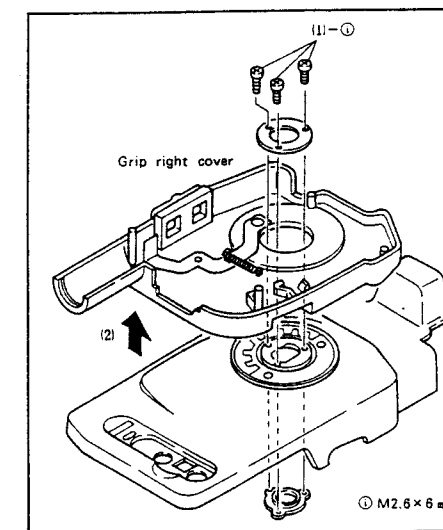


Fig. II-12

2-2 Disassembling of camera section

2-2-1 Removal of CAMERA-KEY P.C.B. and REMOCON P.C.B.

- (1) Remove the screw (f).
 - (2) Release the (A) and (B) parts. Then, while pulling it upward, remove the CAMERA-KEY P.C.B. and REMOCON P.C.B.
 - (3) Remove the REMOCON P.C.B.
- * Note: Remove the CAMERA-KEY P.C.B. giving attention to the B to B connector (E400, 600E only)

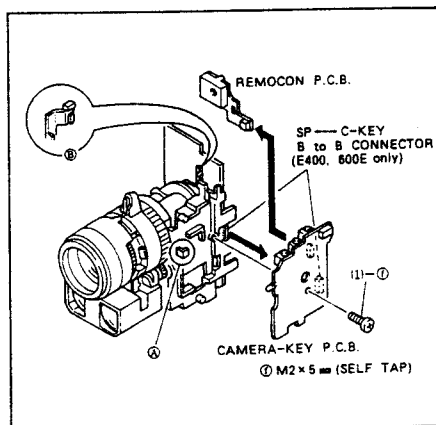


Fig. II-13

2-2-2 Removal of SP P.C.B.

- (1) Remove the CNs 101, 1001, 1101 and 1104.
- (2) Unsolder the pins of CCD.
- (3) Remove two screw (j) s.
- (4) Remove the SP P.C.B.

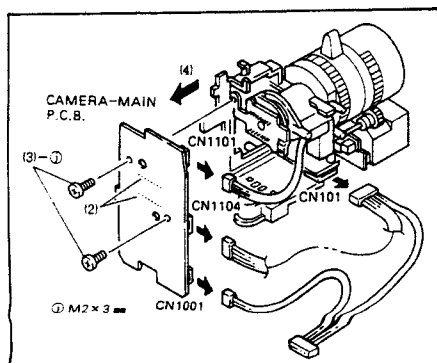


Fig. II-14

2-2-3 Removal of camera holders A and B

- (1) Remove two screw (f) s and two screw (d) s, dismount the camera holders A and B.

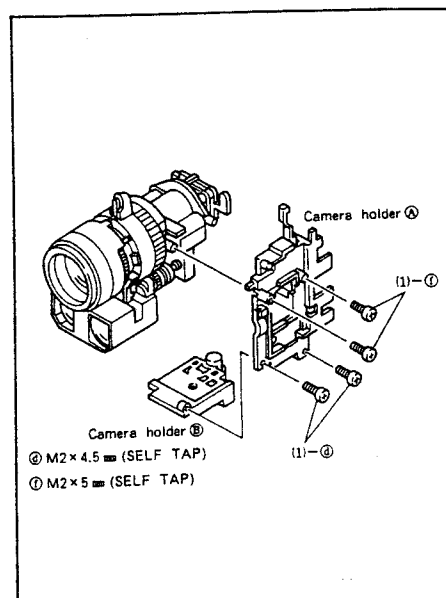


Fig. II-15

2-2-4 Removal of CCD holder

- (1) Remove two screw (k) s, and remove the CCD holder.

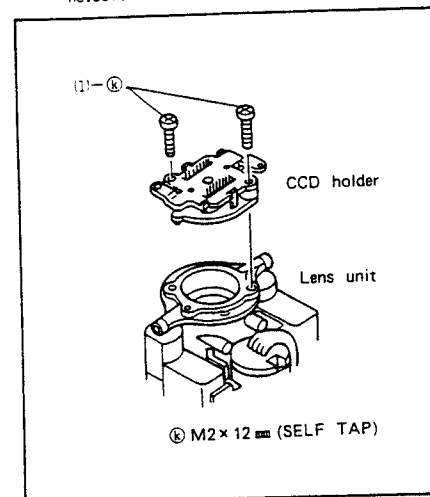


Fig. II-16

2-2-5 Removal of CCD unit

- (1) Unclaw two (A) s, and remove the CCD unit.
- (2) Remove the CCD rubber and the infrared cutting filter. (E600E is crystal filter)

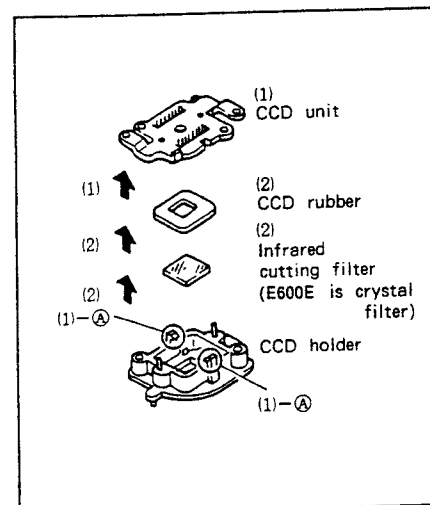


Fig. II-17

2-2-6 Reassembling of CCD section

- (1) Install the infrared cutting filter (E600E is crystal filter) and then the CCD rubber on the CCD holder.

* Note: Remove the dust particles.

- (2) Install the CCD unit on the CCD holder.

* Notes: 1. Check the directivity referring to the Fig. II-18.

2. Push the unit until the two hooks (A) are completely hooked.

- (3) Install the CCD holder on the lens unit, and fix it with two screw (k) s.

* Note: Check the directivity referring to the Fig. II-18.

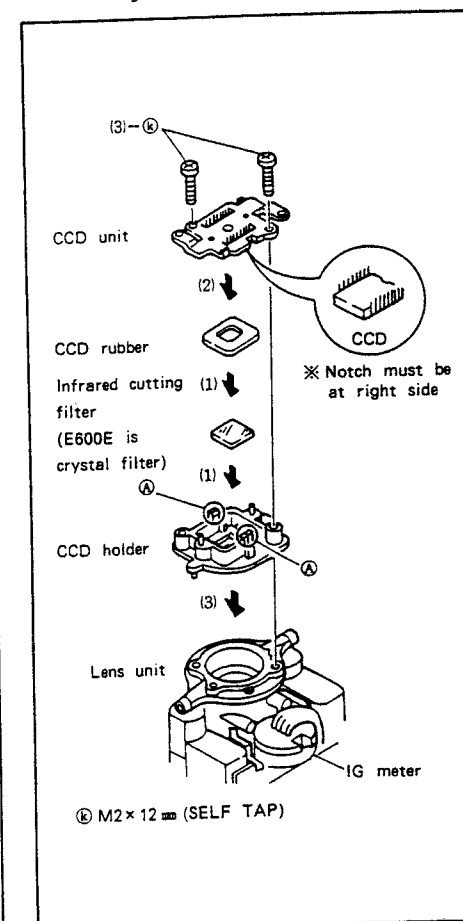


Fig. II-18

2-3 Disassembling of lens section

2-3-1 Removal of Focus P.C.B. and AF block

- (1) Unplug the CN102 and CN101.
- (2) Remove the screw ①.

* Notes: 1. Before reassembling, check if the lever of parallel prism is not on the distance ring. (Then, secure it with the screw.)

2. After the replacement of AF block, be sure to perform the AF measuring adjustment. (P. II-19)

- (3) Unplug the CN101 and CN103.
- (4) Remove the screw ② and the Focus P.C.B.

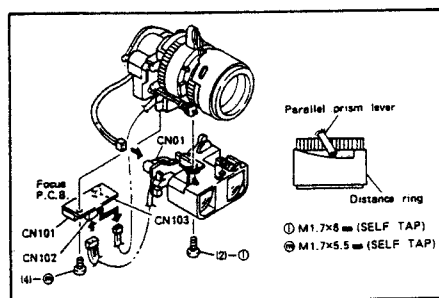


Fig. II-19

2-3-2 Removal of infinity switch

- (1) Remove the screw ③, and remove the infinity switch.

* Notes: 1. When reattaching, align the shorter side of switch with the second line of graduation marked on the AF block. (Count the graduation from the left side)

2. Hook the lead wire on the rib of AF block.

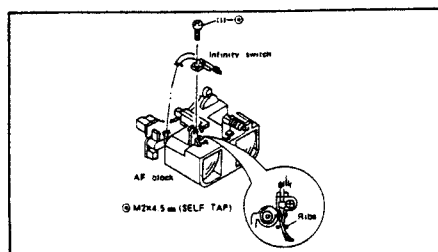


Fig. II-20

2-3-3 Removal of AF motor, PZ motor and IG meter unit

- (1) Unhook the ④, and remove the AF motor while unhooking ⑤.
- (2) Remove the PZ motor in the same manner as above.
- (3) Unhook the ⑥, and remove the IG meter unit.

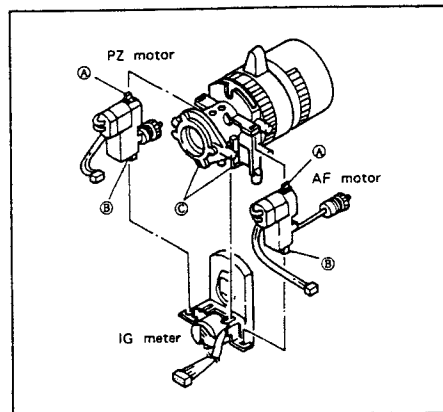


Fig. II-21

2-3-4 Removal of low-pass filter

- (1) Remove the low-pass filter by unhooking two ⑦'s.

* Notes: 1. Before reassembling, check the flaw, dust particles, etc. on the low-pass filter. (If there is the dust particles, remove it carefully by using the solvent a little.)

2. When reassembling, check the directivity of low-pass filter.

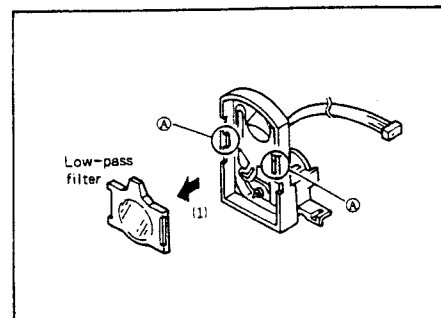


Fig. II-22

2-3-5 Removal of relay lens assembly

- (1) Remove the screw ⑧, and dismount the relay lens assembly.

* Notes: 1. Before reinstalling the relay lens assembly, clean the dust particles, etc. on the assembly.

2. After the reinstallation, be sure to perform the back focus adjustment. (P. II-23)

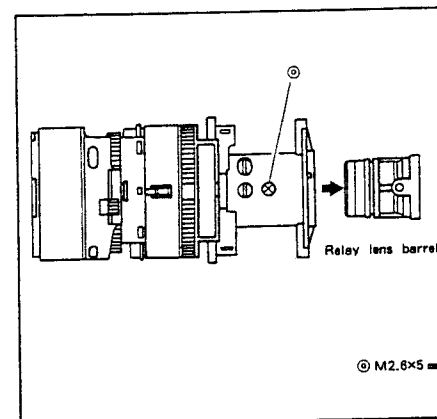


Fig. II-23

2-3-6 Disassembling of zoom section

- (1) Remove three screw ⑨'s.
- (2) While steadying the zoom section, turn the focus lens assembly up.
- (3) Set the zoom lever on the position as shown in the Fig. II-24.
- (4) While steadying the zoom ring, dismount the focus lens assembly and the fixed lens barrel upward.
- (5) Remove the zoom ring.
- (6) Remove the cam ring.
- (7) Remove the variator and the compensator lenses.
- (8) Remove the spring and three guide bars. (E200, 400E only)
- (9) Remove the spring and guide bars (A) x 2, (B) x 1. (E600E only)

* Note: Note that the guide bars A and B are different in length. (E600E only)

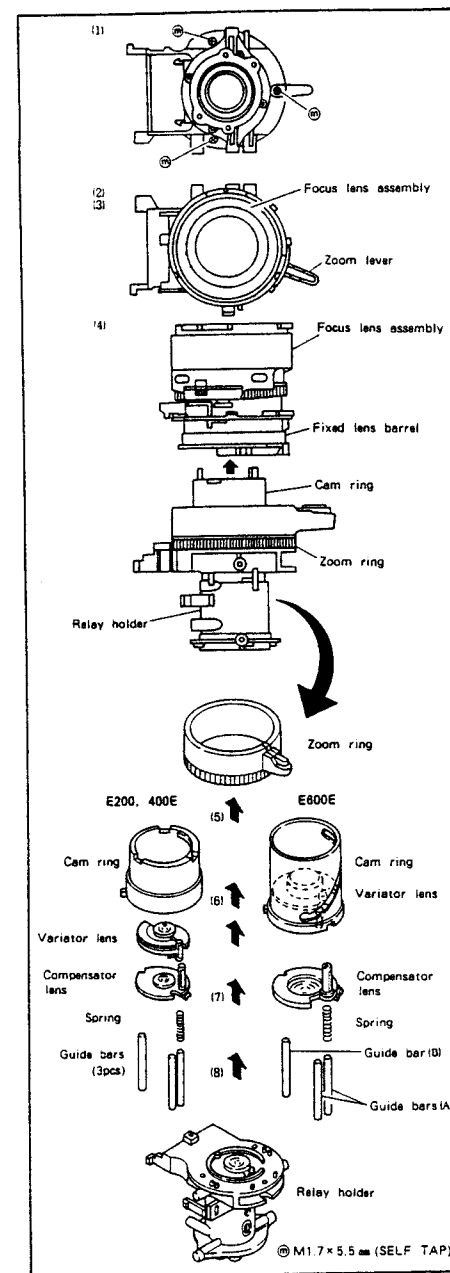


Fig. II-24

2-3-7 Removal of focus lens assembly

- (1) Hold the (A) of distance ring.
- (2) Remove the focus lens assembly.

* Note: Do not use the removed focus lens assembly again.
(Use the new one.)

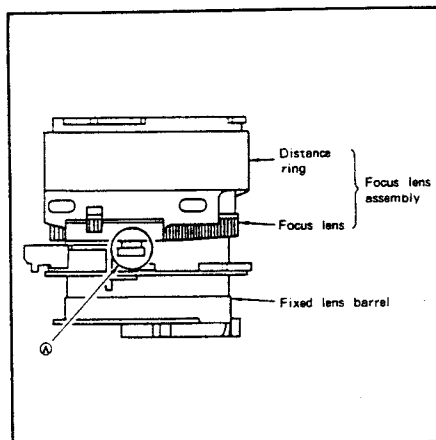


Fig. II-25

2-3-8 Reassembling of focus lens assembly

- (1) While aligning (A) and (B), reassemble the fixed lens barrel and the focus lens.
- (2) Turn the focus lens completely to an end, turn it back to the position where the (C) and (D) are aligned.
- (3) While aligning (E) and (F), reassemble the distance ring and the focus lens.

* Notes: 1. If there is the flaw, dust particles, etc. on the lens, clean or replace it.
2. After reassembling, perform the afocal lens adjustment. (P. II-30)

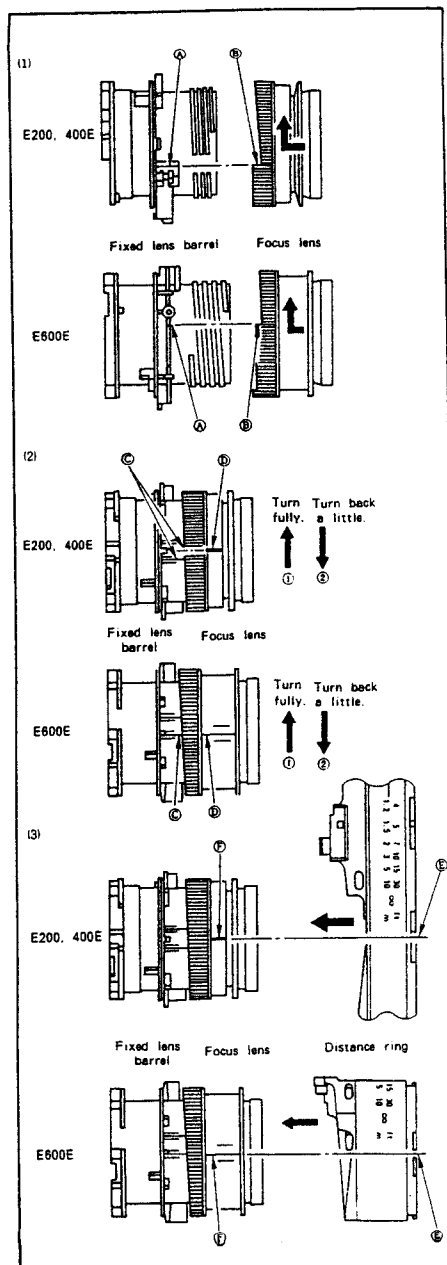


Fig. II-26

2-3-9 Reassembling of zoom section (E200, 400E)

- (1) Install the guide bars (3 pcs.), spring and the compensator lens on the relay holder.
- (2) Attach the cam ring.
- * Note: Align the convex of cam ring with the position (A).
- (3) Install the variator lens, and turn the cam ring until the convex is aligned with (B).

* Note: Insert the V cam lift of cam ring into the space between the springs (A) and (C).

- (4) Install the Zoom ring.

* Note: Align the both convexes of zoom and the cam rings.

- (5) Install the fixed lens barrel and the focus lens assembly.

- (6) Secure three screw (M).

* Notes: 1. If there is the flaw, dust particles, etc. on the lens, clean or replace it.
2. By moving the zoom lever, check the operation.

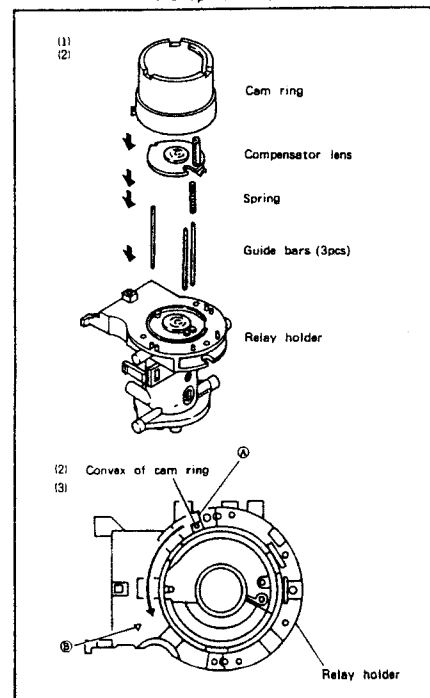


Fig. II-27

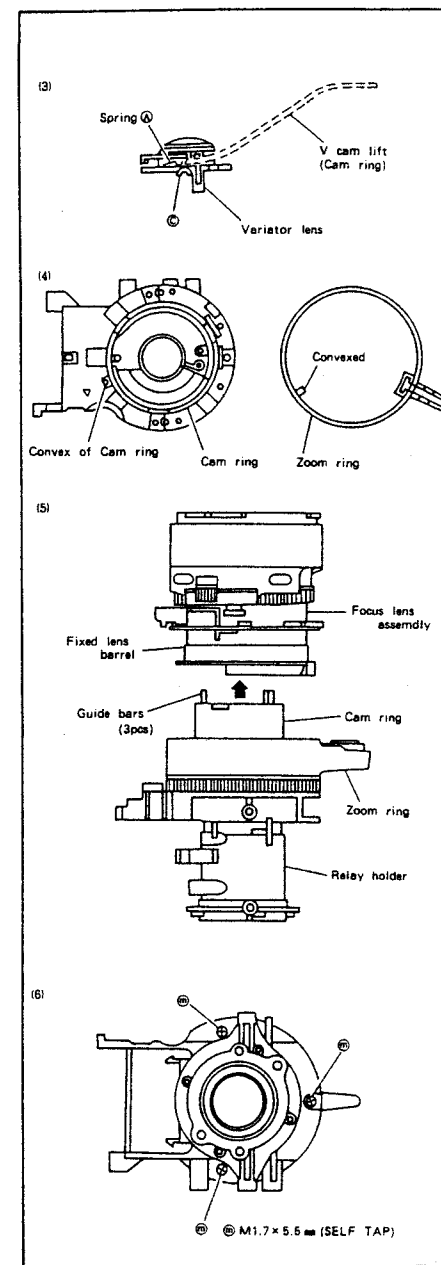


Fig. II-28

2-3-10 Reassembling of zoom section (E600E)

- (1) Install the guide bars ((A)x2, (B)x1), spring and the compensator lens on the relay holder.
 - (2) Combine the cam ring with the variator lens, and then install it.
- * Note: Align the convex of cam ring with the position (A).
- (3) Turn the cam ring until the convex is aligned with (B).
- * Note: Install so that the roller of compensator lens touches the C cam lift.
- (4) Install the zoom ring.
- * Note: Align the both convexes of zoom and the cam rings.
- (5) Install the fixed lens barrel and the focus lens assembly.
 - (6) Secure three screw (M).
- * Notes: 1. If there is the flaw, dust particles, etc. on the lens, clean or replace it.
2. By moving the zoom lever, check the operation

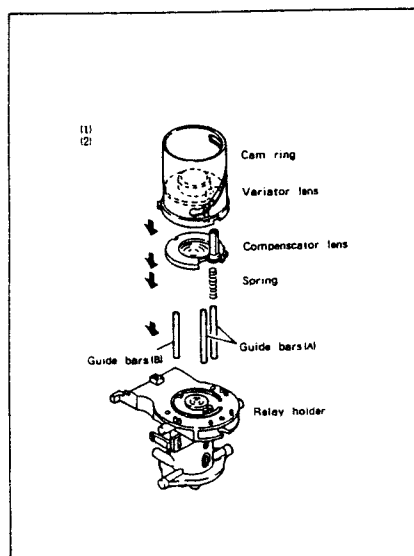


Fig. II-29

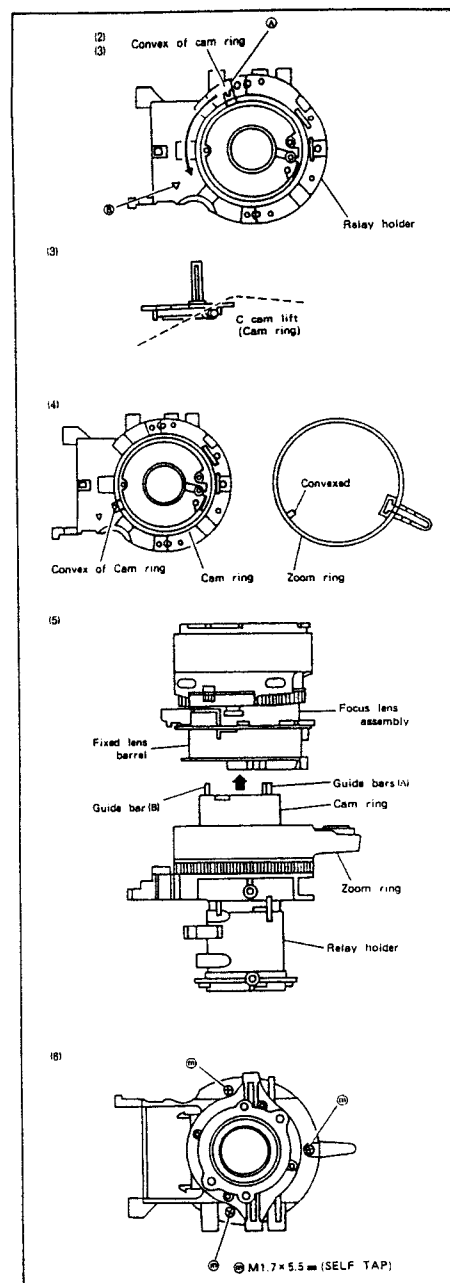


Fig. II-30

2-3-11 Application positions of oil, grease and adhesive (E200, 400E)

After the replacement, cleaning, etc., apply the followings adhesives on the positions indicated below. (The No. in the Fig. II-31 indicate the kinds of adhesive.)

- ① Mix the GE-X8 (CY9-8044-000) and the GE-C9 (CY9-8043-000)
* Mix ratio (weight): 1:1
- ② GE-X8 (CY9-8044-000)
- ③ Mix the GE-C4 (CY9-8045-000) and the Teflon Fluorocarbon Resin MP-102 (DY9-3013-000).
* Mix ratio (weight)
GE-C4 : MP102
10 : 5
- ④ Mix the GE-C4 (CY9-8045-000) and the Teflon Fluorocarbon Resin MP-102 (DY9-3013-000).
* Mix ratio (weight)
GE-C4 : MP102
10 : 2
- ⑤ Alonalpha (DY9-8007-000)
- ⑥ Floil G902 (DY9-3017-000)

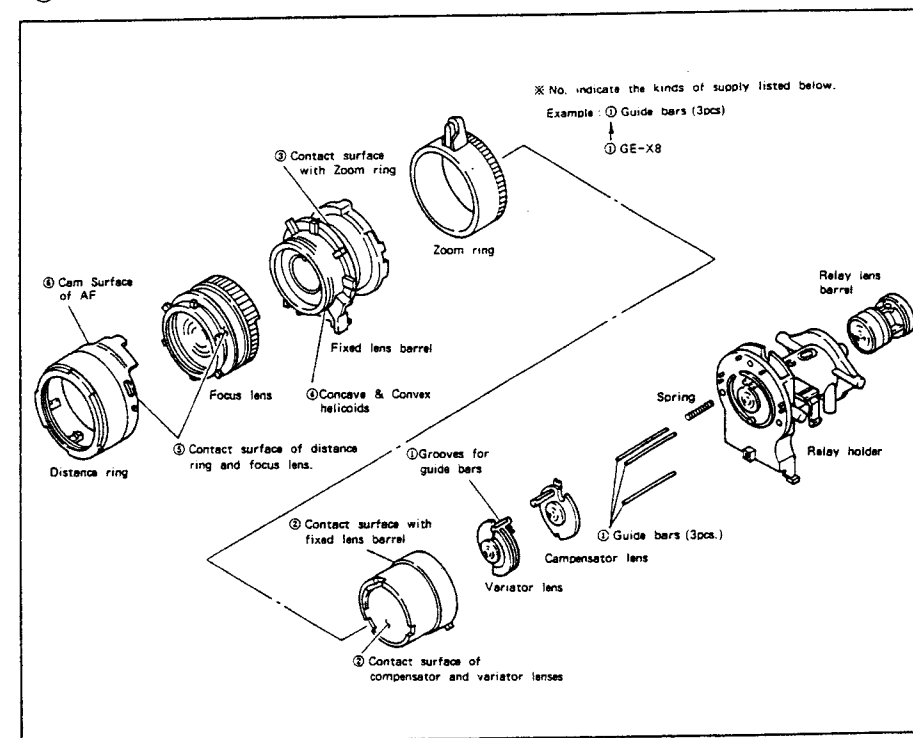


Fig. II-31

2-3-12 Application positions of oil, grease and adhesive (E600E)

After the replacement, cleaning, etc., apply the followings adhesives on the positions indicated below. (The No. in the Fig. II-32 indicate the kinds of adhesive.)

- ① Mix the GE-X8 (CY9-8044-000) and the GE-C9 (CY9-8043-000)
* Mix ratio (weight): 1:1
- ② GE-X8 (CY9-8044-000)
- ③ Mix the GE-C4 (CY9-8045-000) and the Teflon Fluorocarbon Resin MP-102 (DY9-3013-000).
* Mix ratio (weight)
GE-C4 : MP102
10 : 5
- ④ Mix the GE-C4 (CY9-8045-000) and the Teflon Fluorocarbon Resin MP-102 (DY9-3013-000).
* Mix ratio (weight)
GE-C4 : MP102
10 : 2
- ⑤ Alonalpha (CY9-8007-000)
- ⑥ Floil G741B (DY9-3021-000)
- ⑦ Floil G902 (DY9-3017-000)

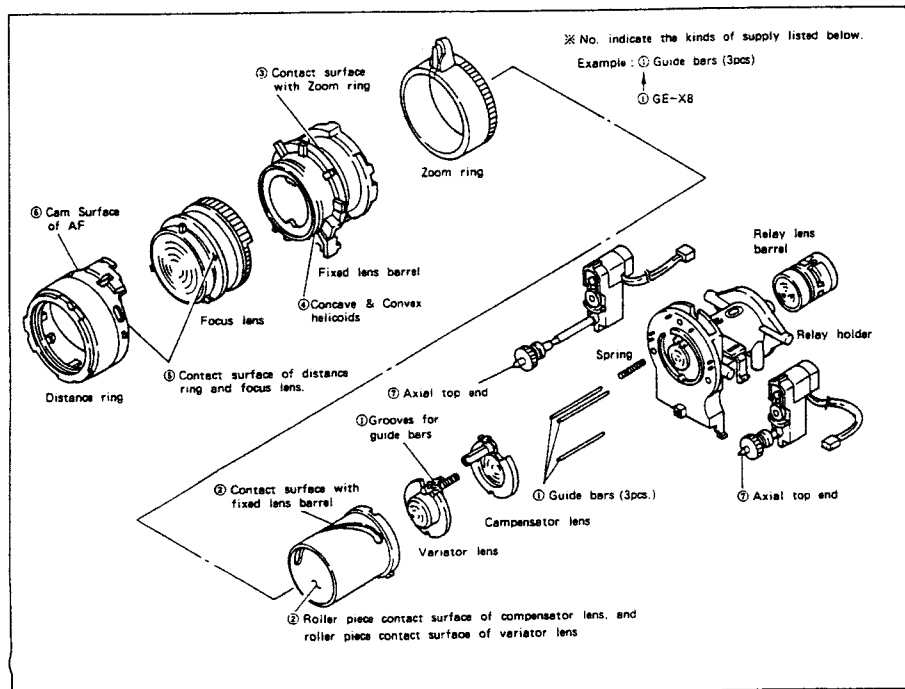


Fig. II-32

2-4 Disassembling of recorder section

2-4-1 Removal of RECORDER-KEY P.C.B.

- (1) Remove the CN107, and remove the RECORDER-KEY P.C.B.

* Notes: 1. When reassembling, align the holes of P.C.B. and the dowels of recorder holder.
2. If the P.C.B. is deformed by removing, replace it.

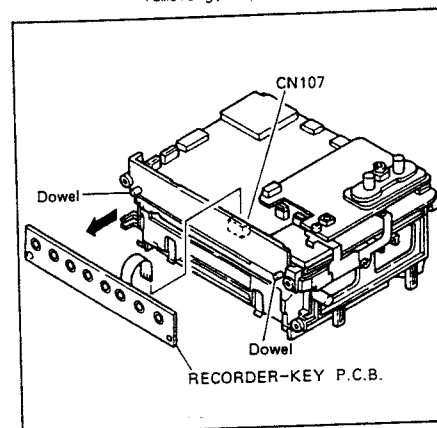


Fig. II-33

2-4-2 Removal of AUDIO P.C.B.

- (1) Remove the screw (D).
(Remove two screw (D) in case of E600E.)
- (2) Remove the AUDIO P.C.B. by lifting.

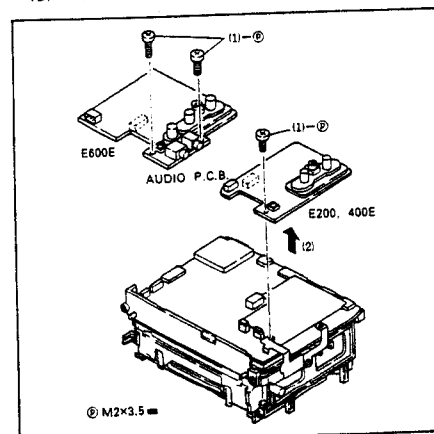


Fig. II-34

2-4-3 Removal of VS P.C.B. (Part I)

- (1) Remove the screw (E) and remove the Audio holder giving attention to the part (A)
- (2) Unsolder (B), and unplug the CN401.
- (3) Unplug the CNs 101, 102, 104 and 106.

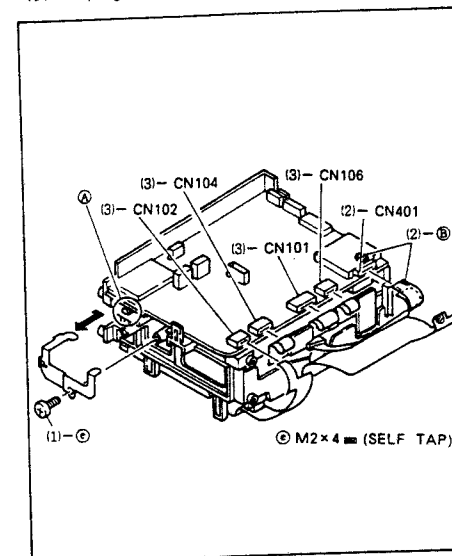


Fig. II-35

2-4-4 Removal of RECORDER-MAIN P.C.B. (Part II)

- (1) Remove the screw (D).
- (2) Unhook the (A) and (B), then, remove the VS P.C.B.

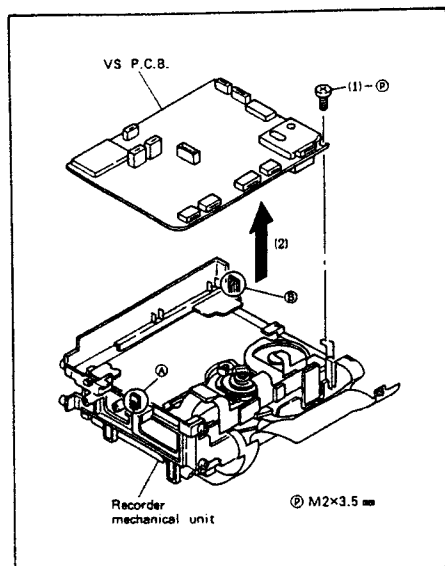


Fig. II-36

2-4-5 Removal of recorder holder

- (1) Remove the shield.
- (2) Unplug the flexible connectors (A), (B), (C) and (D).
- (3) Remove three screw (E)s, and dismount the recorder holder upward.

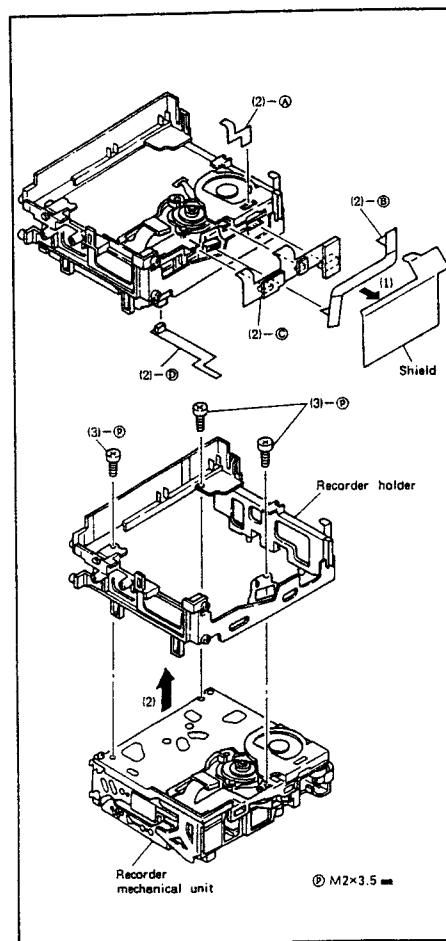


Fig. II-37

2-5 Wirings

2-5-1 GRIP P.C.B.

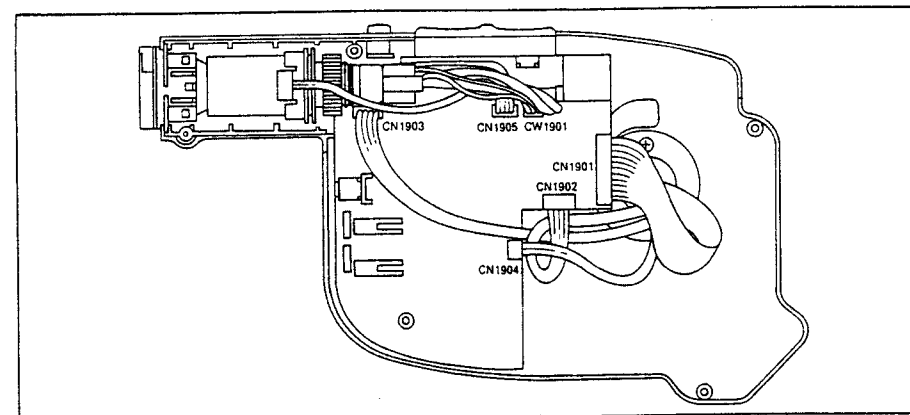


Fig. II-38

2-5-2 Recorder and camera units

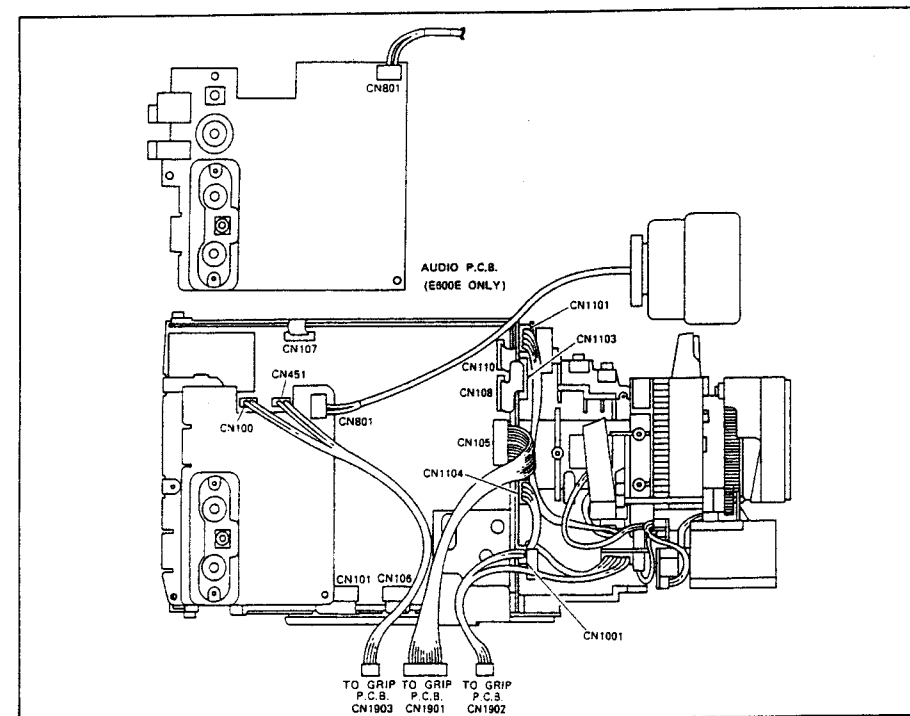


Fig. II-39

2-5-3 Camera unit only

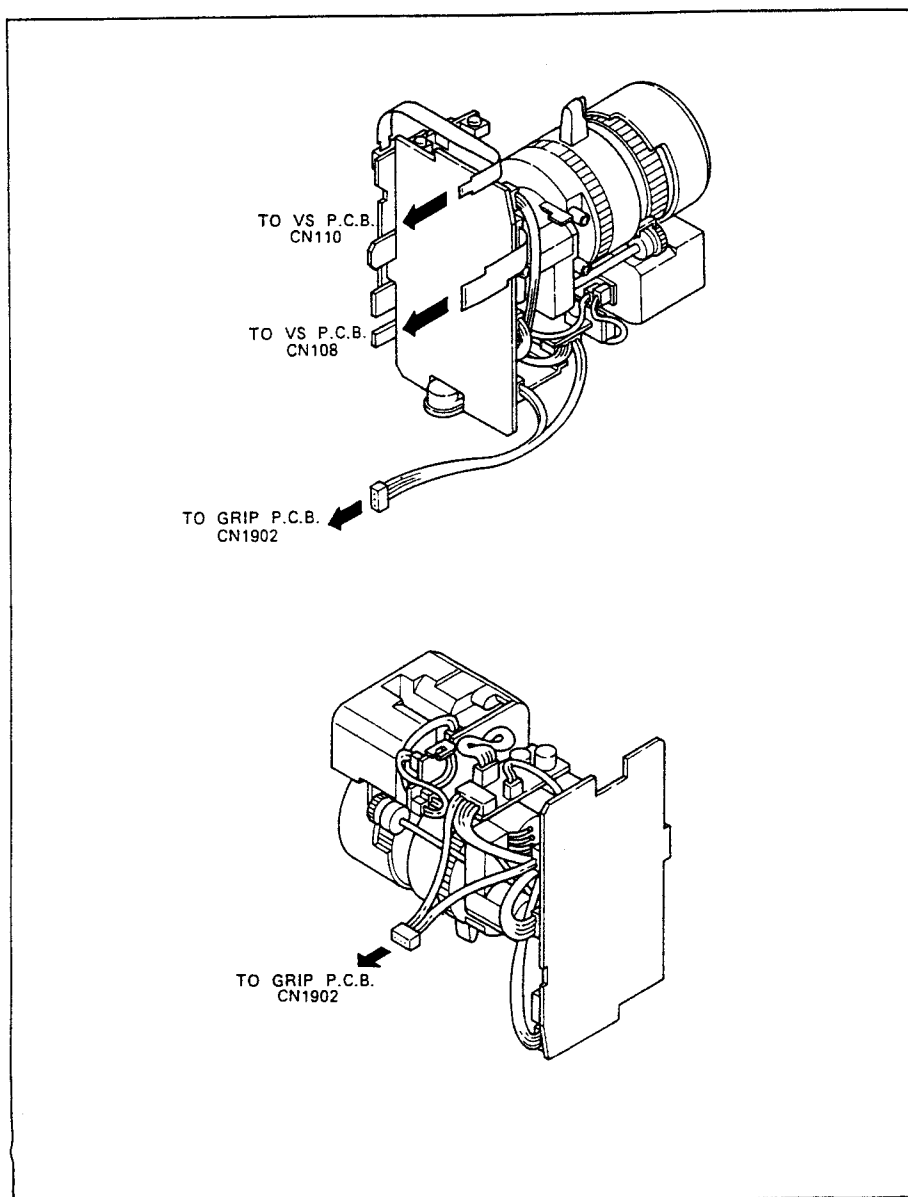


Fig. II-40

2-6 Screws position (External)

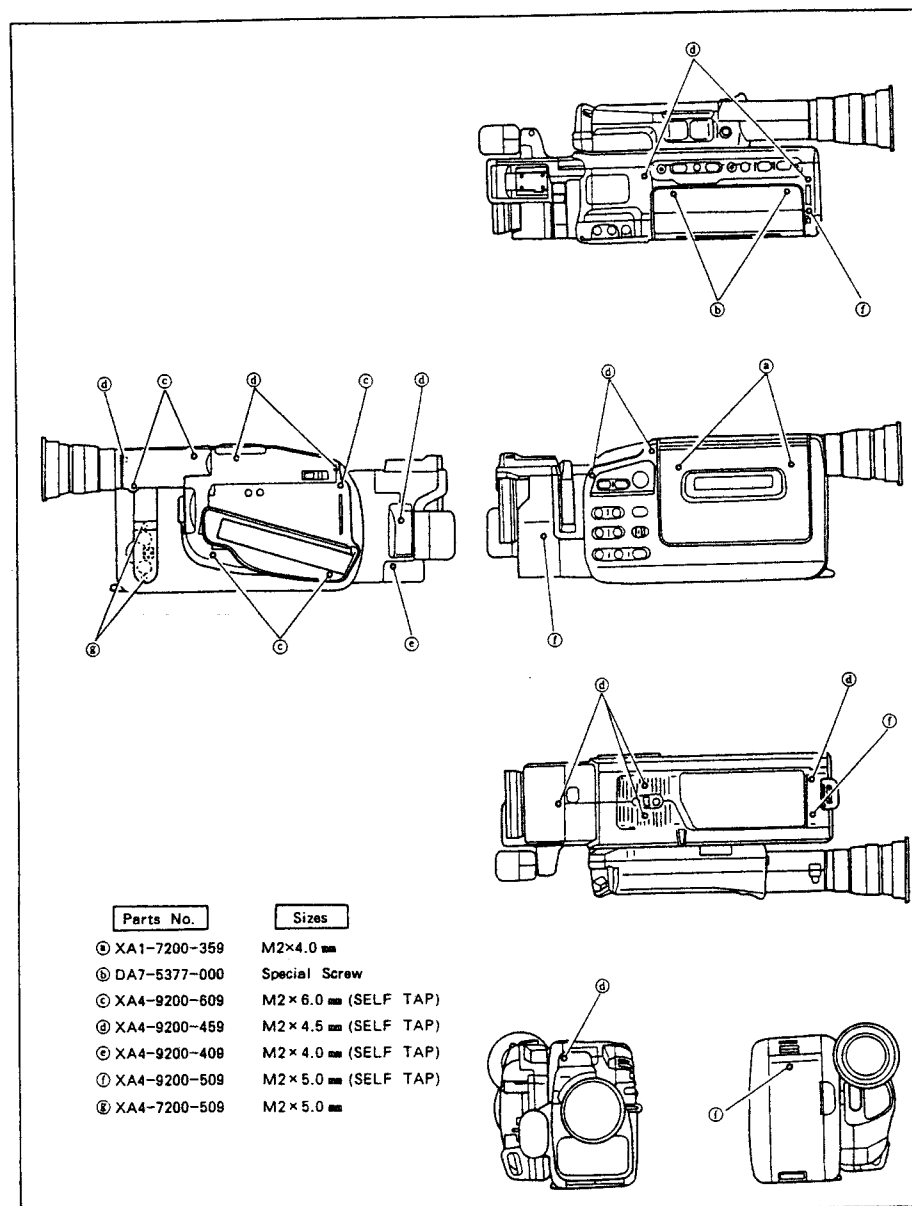


Fig. II-41

3-1 Kinds of adjustment

- Mechanical adjustments (Focusing)
- Electrical adjustments (Camera picture)
- Tape path adjustment
- Electrical adjustments (Rec. PB)
- VC, VR, Microcomputer
- EVF adjustment
- VR, CRT assemblies

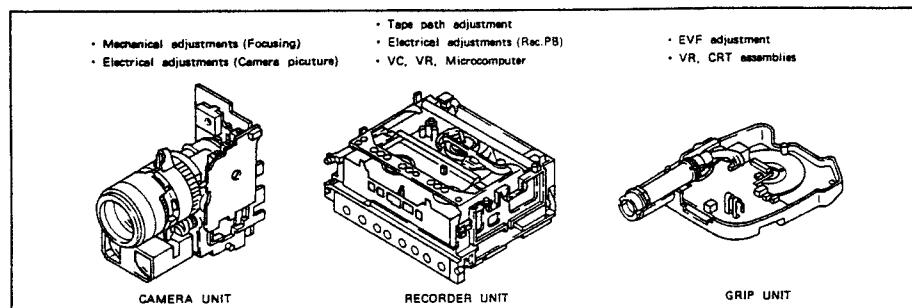


Fig. II-42

Location	Electrical/Mech.	Adj. item	Mode	Setting
Lens	Mechanical	AF. Focus	Normal	Basic setting
Camera	Electrical	VCs	Normal	Basic setting
		Microcomputer	Service mode (6)	Basic setting Note: For VC under the C-KEY P.C.B., add the procedures of 3-3 (P. II-22, "How to open P.C.B.s") ... (E400, 600E only)
Recorder	Electrical	VRs, VCs	Normal	Basic setting Note: For VRs under the VS P.C.B., add the procedures of 3-3 (P. II-23, "How to open P.C.B.s")
		Microcomputer (Battery drop)	Service mode (3)	Disassembling not necessary *1 (complete product)
	Mechanical	Tape transport	Service modes (2) and (4)	Basic setting
EVF	Electrical and mechanical	EVF	Normal	6 V applied without the grip left cover. *2

*2 Setting for EVF mechanical adjustment

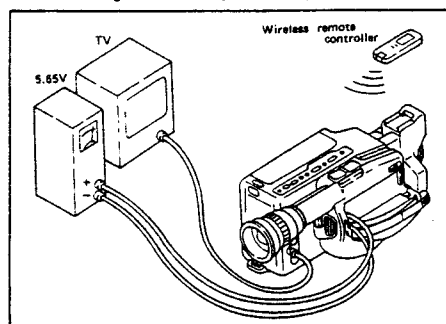


Fig. 11-43

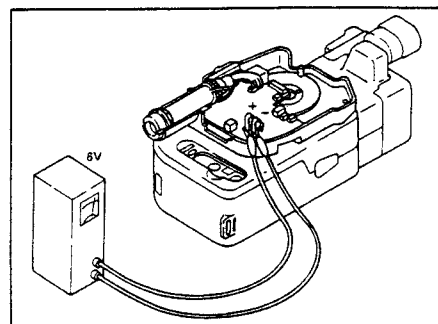


Fig. II-44

(1) Employed jigs, tools and instruments

- * Extension cables
- * Constant voltage supplier (6 V)
- * Constant voltage supplier and battery link interconnecting cable

(2) Procedure

- 1) After disassembling down to the camera unit and recorder unit, interconnect the camera unit, recorder unit and GRIP P.C.B. by cables referring to Fig. II-45.
- 2) Supply 6 V from the constant voltage supplier to the battery link of GRIP P.C.B.

(3) Purpose

At this status, adjust and check the camera unit and recorder unit. The same operation as when completed integrally is available.

Adjust the circuit board rear and adjust the VRs under the board using the extension cables to be discussed in the subsequent section.

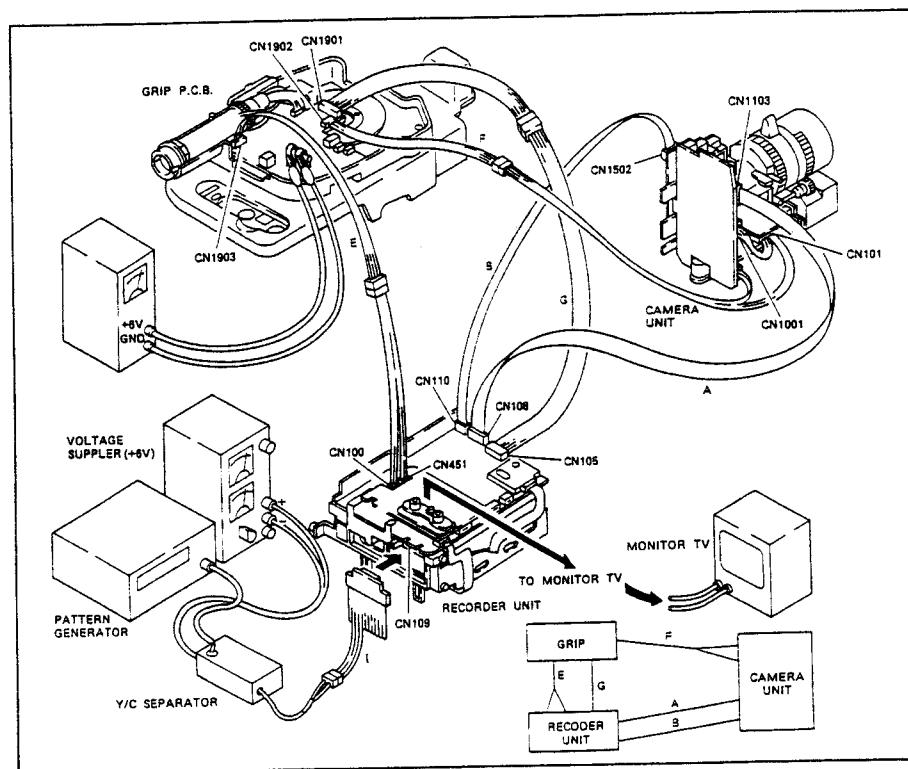


Fig. 11-45

3-3 How to open P.C.B.s

3-3-1 C-KEY P.C.B. (E400, 600E only) (Fig. II-46)

To check the components at rear side of C-KEY P.C.B., perform the procedure below.

Procedures:

- (1) Dismount the C-KEY P.C.B.
Then, connect the C-KEY P.C.B. and the SP P.C.B. via an extension cable H.

C-KEY P.C.B. Extension cable SP P.C.B.
CN1501 ↔ H ↔ CN1102

- (2) To use the wireless remote controller, connect the REMOCON P.C.B.

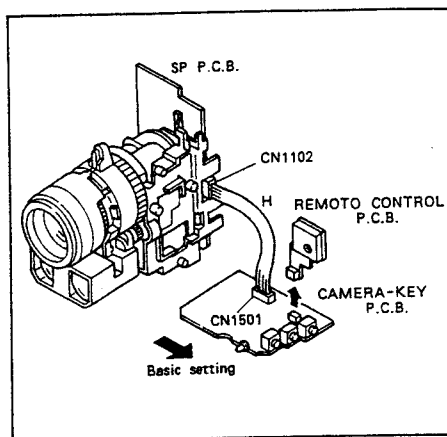


Fig. II-46

3-3-2 SP P.C.B. (Fig. II-47)

By removing the lens unit, and performing the following procedures, the components at rear side of SP P.C.B. can be checked.

Procedures:

- (1) Remove two screws to dismount the SP P.C.B. from the lens and camera holders.

- (2) Connect the SP P.C.B. and the C-KEY P.C.B. via an extension cable H. (for E400, 600E only)

C-KEY P.C.B. Extension cable SP P.C.B.
CN1501 ↔ H ↔ CN1102

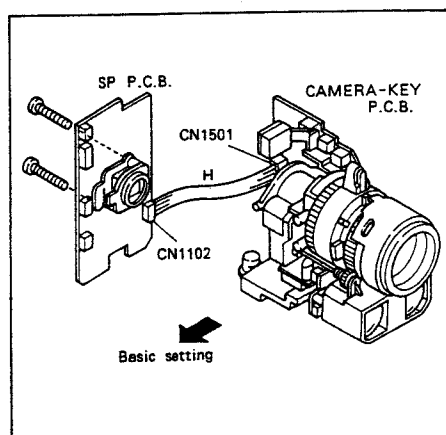


Fig. II-47

* Remarks: The connection with the lens unit is unnecessary because the lens unit is not used.

3-3-3 AUDIO P.C.B. (Fig. II-48)

Under the following status, the VRs under the AUDIO P.C.B. (rear side also) can be checked.

- (1) Remove the screw (E600E: 2 pcs.) to dismount the AUDIO P.C.B. which fixed by the connectors.
- (2) Connect the AUDIO and VS P.C.B.s with the extension cable D.

AUDIO P.C.B. Extension cable VS P.C.B.
CN802 ↔ D ↔ CN452

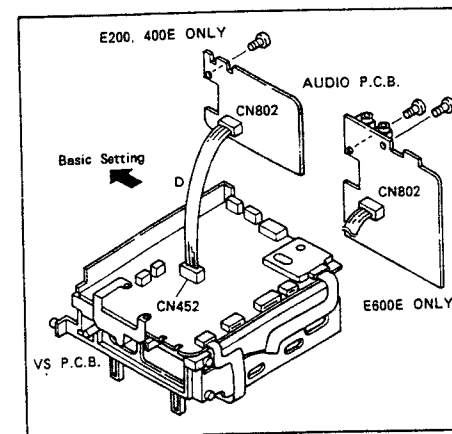


Fig. II-48

3-3-4 VS P.C.B. (Fig. II-49)

Under the following status, the components under the VS P.C.B. and the rear side of recorder mechanical section can be checked.

- (1) Open the VS P.C.B. by removing the screw and CN107.
(Disconnection of CNs 101, 102, 104, 106 and 401 are not necessary.)

- (2) Connect the extension cable C (Recorder key P.C.B.) to the VS P.C.B.

VS P.C.B. Extension cable
CN107 ↔ C

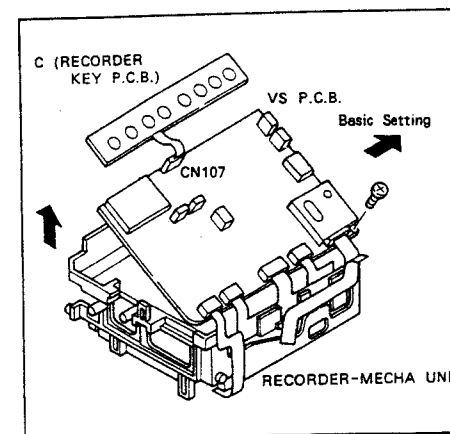


Fig. II-49

3-4 Service modes

3-4-1 How to set service modes

The normal mode can be switched to the service modes (<1> to <7>) by short-circuiting the patterns of the remote controllers. The positions to be short-circuited are also shown in Fig. II-50. (The remote controller WL-1 also has patterns but no hole in its outer casing. Therefore, use the conventional remote controller specified in Fig. II-50.)

The remote controllers are classified as service parts.

Example: WL-600 (DY2-1294-000)

Switching between the normal mode and service modes or among the service modes occurs each time the Service Mode key is pressed. (Fig. II-51)

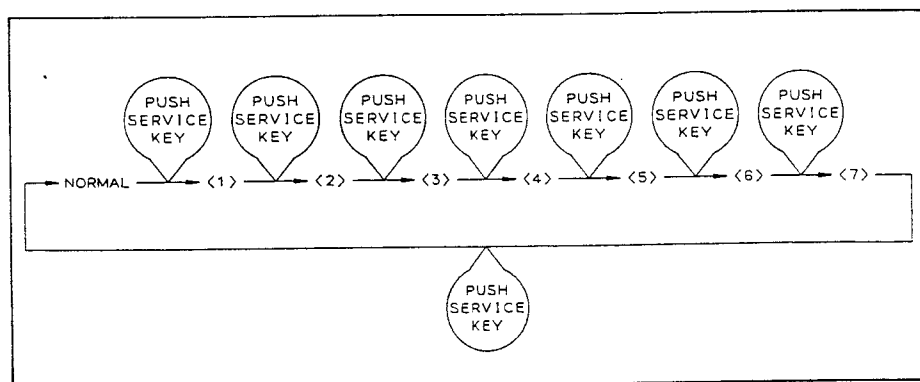


Fig. II-51

During the service mode, the shut-off function by followings are cancelled.

- * DEW
- * BATTERY LEVEL
- * PAUSE TIMER

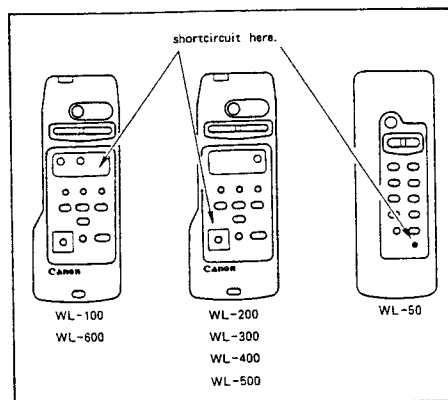


Fig. II-50

3-4-2 Explanation of each mode

(1) Service mode <1>

AWB turbo mode (no screen display)
Increases the control speed for auto white balance.

(2) Service mode <2>

Aging mode (cassette detection inactive, AF OFF)
Pressing play key on the main unit selects the PLAY mode without tape.
Canceled by stop key.

(3) Service mode <3> (Fig. II-52)

Insufficient voltage/PG-DL adjustment mode.

- * Insufficient voltage
Pressing C. RESET key in REC mode changes the current voltage to the date of insufficient voltage.
- * PG-DL
Pressing C. RESET key in the monosco (DY9-1062-000) playback let the PG-DL data written into the E²PROM.

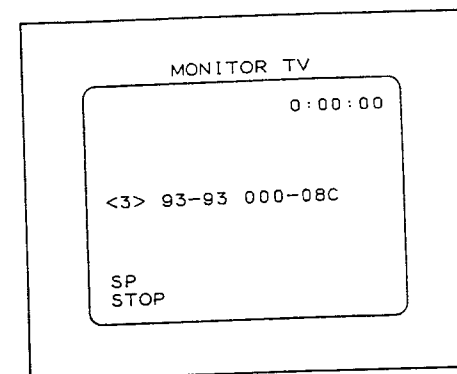
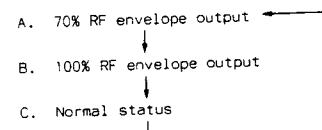


Fig. II-52

(4) Service mode <4>

For run adjustment. The switching pulse duty ratio is changed and RF envelope is fully checked.

C.RESET key selects any of 3 statuses below (no indication)



* Note: The current status can be checked by the light of Power LED.

- A: 0.5 sec flashing
- B: 1 sec flashing
- C: Lights up

In the service mode <4>, 70% envelope status is selected at all times.

(5) Service mode <5> (Fig. II-53, 54)

Error detection mode.

①, ②, ④ ... Recorder mode

① = Communication mode from main-microcomputer to servo microcomputer

④ = Communication mode from servo microcomputer to mechanical chassis.

② = Mechanical mode

Example: Data Mode
22 STOP NO CASSETTE
02 DONE
04 EJECT
20 STOP
C0 PB

③ ... Mode detection

Left No. Right No.
1 = S-reel sensor 1 = Dew sensor
2 = T-reel sensor 2 = Tape
4 = EOT sensor 4 = Protection switch against erroneous correction
8 = BOT sensor 8 = Cassette compartment lock switch

* Note: If two or more statuses are detected simultaneously, the addition is indicated. (Hexadecimal)

⑤ ... Error

Left No. Right No.
1 = S-reel error 1 = DEW
2 = T-reel error 2 = Loading motor error
4 = EOT 4 = Capstan error
8 = BOT 8 = Drum error

* Notes: 1. If two or more errors are detected simultaneously, the addition is indicated. (Hexadecimal)

2. The indication can be cleared by pushing the EJECT key.

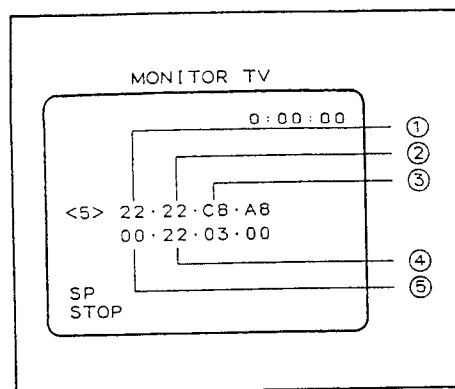


Fig. II-53

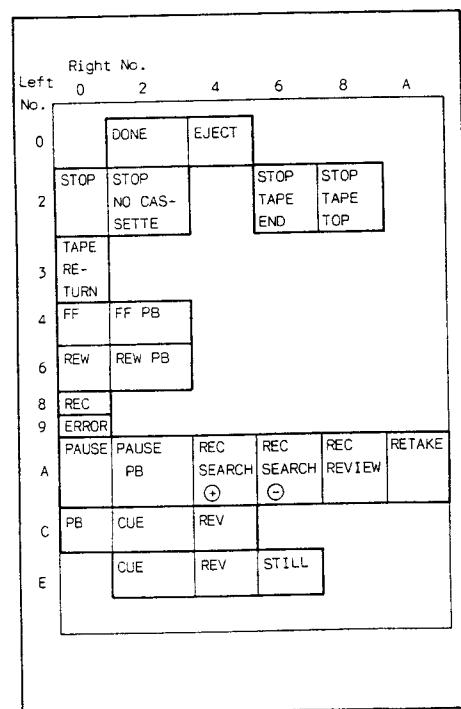


Fig. II-54

(6) Service mode <6> (Fig. II-55)

For camera microcomputer adjustment.

Different adjusting data in E²PROM of camera microcomputer are displayed.

The E²PROM data can be set from 0000 to FFFC. However, as shown in the table, from B701 to B719 are used for the adjustment.

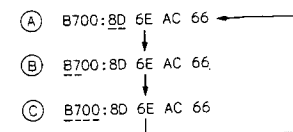
Every adjustment can be made by a remote controller.

* Method of Setting and Adjusting Data

To set or adjust data in the E²PROM, operate keys on a remote controller as follows:

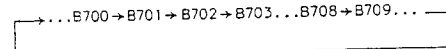
① COUNTER RESET: Reference address shift key

Pressing this key shifts the underline to the reference address for choosing the desired address.



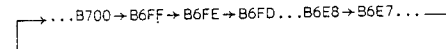
② PLAY (▶): Data selection key (1)

Every pressing this key advances the data address.



③ STOP (■): Data selection key (2)

Every pressing this key recedes the data address.



④ FF (▶▶): Reference address shift key/ Data setting key

* Pressing this key in ① state, the reference address can be shifted.

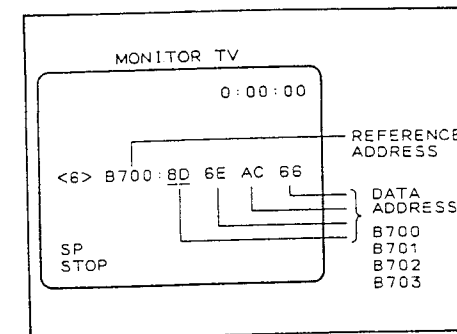
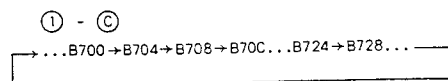
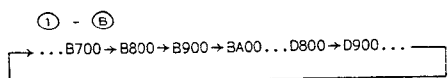


Fig. II-55

Table II-3

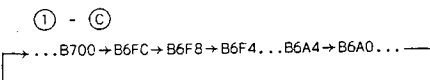
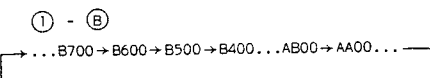
Address	Data name	Data
B701	Vsub voltage adjustment	Adjustment value
B702	OB set adjustment	Auto adjustment
B703	Auto iris adjustment	
B704	YAGC adjustment	
B705	1/2 fH color difference adjustment	
B706	Chroma offset adjustment	
B707	CL gain adjustment	
B708	Carrier balance R-Y adjustment	
B709	Carrier balance B-Y adjustment	
B70B	Burst level adjustment	
B70C	5600°K R contrast adjustment	
B70D	5600°K B contrast adjustment	Auto adjustment
B70E	white balance set adjustment	
B70F	Black adjustment	
B710	R-Y gain adjustment	
B711	B-Y gain adjustment	
B712	R-Y matrix adjustment	
B713	B-Y matrix adjustment	
B714	3200°K R contrast adjustment	
B715	3200°K B contrast adjustment	
B716	3200°K white balance reference adjustment	
B717	5600°K white balance reference adjustment	Adjustment value
B719	white clip adjustment	



* Pressing this key after ②/③, the data can be changed.

⑤ REW (◀◀): Reference address shift key/Data setting key

* Pressing this key in ① state, the reference address can be shifted.



* Pressing this key after ②/③, the data can be changed.

⑥ REC (●): Data writing key

Pressing this key let the selected data written into the E²PROM of camera micro-computer.

(7) Service mode <7> (Fig. II-56)

Not used for servicing.

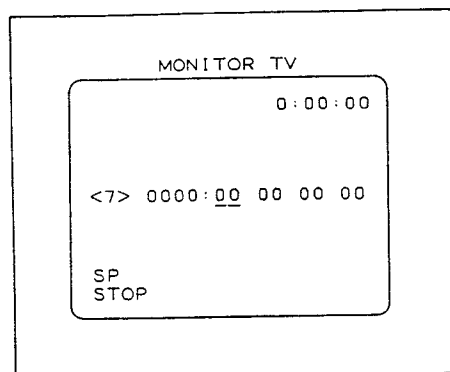


Fig. II-56

3-5 Other precautions

- (1) Prior to each adjustment, energize the equipment for 3 minutes or longer.
- (2) Set the light box at color temperature 5600°K.
- (3) "Standard angle of view"

- * The "standard angle of view" is given when the charts displayed so as to meet the maximum screen of the full scan monitor.
- * With an oscilloscope, adjust the grayscale (36 μs) and the color bar (52 μs) followed by shooting.
- * Shoot the white chart at its center.
- * Unless otherwise specified, shooting distance must be 1.4 m.

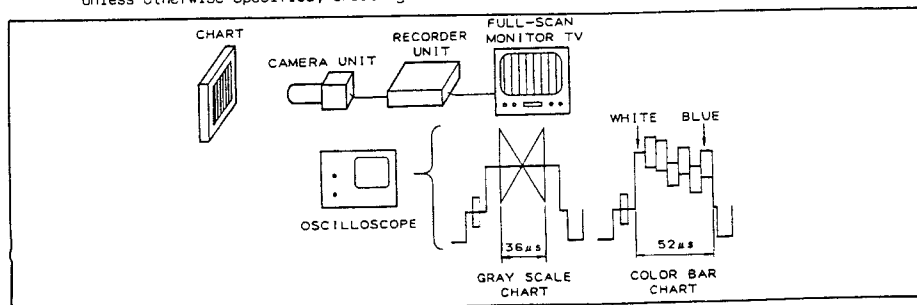


Fig. II-57

4. Adjustment of Lens Section

4-1 Back focus adjustment (T/W zoom correction)

* Note: Open the aperture fully as possible.

CHART	Siemens chart (located 3 m away)
M. EQ.	Monitor TV
TOOL	Phillips screwdriver
ADJ.	Distance ring, relay lens
SPEC.	Eliminate defocusing at T/W lens

Procedures:

- (1) Loosen the screw ①.
- (2) With the telephoto-end zoom setting, bring the pattern image into focus by turning the distance ring.
- (3) With the wide-angle end zoom setting, bring the pattern image into focus by moving the relay lens back and forth.
- (4) Repeat the above steps (2) and (3) to remove defocusing at the telephoto and wide angle ends.
- (5) Tighten the screw ① while paying attention not to move the relay lens.
- (6) Perform the AF distance measurement adjustment (4-2).

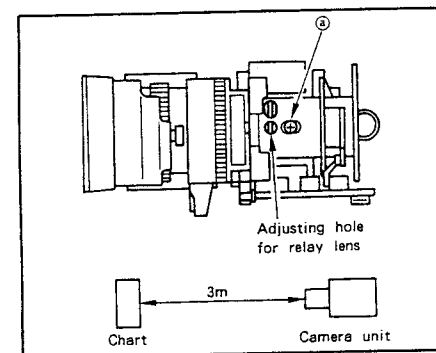


Fig. II-58

4-2 AF distance measurement adjustment

* Note: Open the aperture fully as possible.

CHART	Siemens chart, reflectance plate (60% or more)
M. EQ.	Monitor TV
TOOL	Hexagonal key wrench (1.27 mm) Section paper, index
ADJ.	Adjusting screw of AF distance measurement (② in the Fig. II-74)
SPEC.	+0.75 mm -1.0 mm (+: infinity)

Procedures:

- (1) Put the section paper and the indicator on the ring.
- (2) Shoot the Siemens chart at 3 m distance.
- (3) With telephoto-end, bring the image into focus, and mark the position of indicator on the section paper.
- (4) Replace the Siemens chart with the reflectance plate of 60% or more.
- (5) Make the center of stop positions of infinity end and the closest end on the section paper.
- (6) Check if the difference between the stop positions marked at steps (3) and (5) is within the rating.
- (7) If not, adjust the screw ② with a hexagonal wrench.

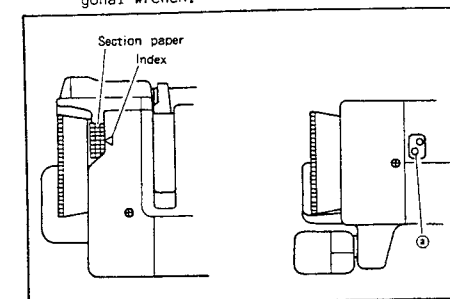


Fig. II-59

4-3 Preparation for afocal adjustment

* Note: Carry out this adjustment by using an actual scene of infinity (150 m or more) or a collimator.

Described below is the procedure by using a single-lens reflex camera instead of collimator.

CHART	Ground glass
TOOL	Single-lens reflex camera lens (focal length: 300 mm or more) Magnifier

Procedures:

- (1) Open the aperture of single-lens reflex camera fully. Then, open a rear lid.
- * Note: If the shutter equips the valve mechanism, lock it for opening the aperture.
If not (e.g. Canon T series, etc.) open the aperture by using the slow shutter function. (Take out the internal battery while the shutter is opened.)

- (2) Secure the ground glass on the inside rail face by pressing it.
- * Note: At this step, the surface of ground must be at the lens side.
- (3) Shoot a scene at infinity. Then, enlarge the image on the ground glass surface with a magnifier to check the focusing state.
- * Note: For the distance for infinity, refer to the Fig. II-60.
- (4) After the above checking, remove the ground glass once, and mark the cross-hairline on the ground glass surface. Then, attach it to the camera again.

* Remarks: Using the above collimator, the back focus adjustment (4-1) can be performed accurately in a short time.

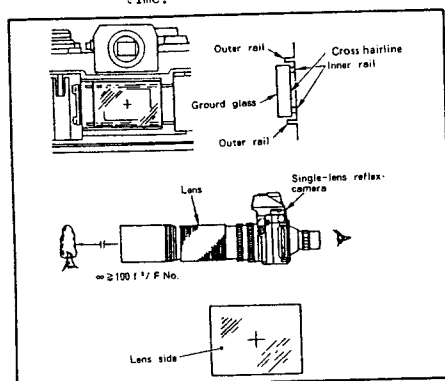


Fig. II-60

4-4 Afocal adjustment (E200, 400E)

* Note: Perform this adjustment only when the focus lens assembly is replaced or disassembled.

Described below is the procedures by using a single-lens reflex camera instead of a collimator.

CHART	Ground glass
M. EQ.	Monitor TV
TOOL	Single-lens reflex camera/lens (300 mm or more) Phillips screwdriver
ADJ.	Focus lens group, relay lens
SPEC.	Smaller than 1/3 of infinity mark width (± 0.5 mm)

Procedures:

- (1) Assemble the concave helicoid and the distance ring.
- (2) Remove the N stopper, and dismount the focus lens assembly.
- * Note: When reassembling, be careful not to damage the thread by excessive force. Also, apply the grease for fixing.
- (3) Align the lens axes of single-lens reflex camera and the equipment as accurately as possible. (Visual check)
- (4) Bring the image into focus with telephoto-end zoom setting by using a front lens.
- * Notes: 1. For use of 8x lens: Distance ring must be butted to the infinity stopper.
2. For use of 10x lens: Distance ring must be positioned at 0.8 mm before the infinity stopper.
- (5) Loosen the screw (a).
- (6) With the wide angle end zoom setting, move the relay lens back and forth to focus the image.
- (7) By repeating the steps (4) and (6), eliminate the defocusing at telephoto and wide angle ends.
- (8) By blocking the relay lens, confirm that there is no defocusing.
- (9) Confirm that the distance ring is butted to the infinity stopper. Then, secure the ring and the concave helicoid with Alonalpha.
- * Notes: 1. Do not apply the adhesive excessively. Also, be careful not to drop the adhesive on except the indicated position, especially on the AF cam surface (D).
2. Do not move or touch the ring for five minutes after application.

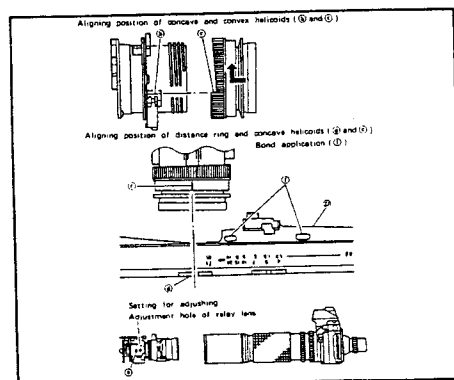


Fig. II-61

4-5 Afocal adjustment (E600E)

* Note: This adjustment is unnecessary unless the focus lens assembly is replaced.

The following explains an adjustment for when a single lens reflex camera is used instead of a collimator.

CHART	Ground glass
M. EQ.	Monitor TV
TOOL	Single lens reflex camera/lens (300 mm or more), Phillips screwdriver
ADJ.	Focus lens, relay lens
SPEC.	1/3 or lens ± 0.5 mm of ∞ mark width

Procedures:

- (1) Combine the concave helicoid and distance ring.
- (2) Remove the N stopper and dismount the focus lens assembly.
- * Note: When assembling, pay attention to the screw-in start position. Do not screw in so forcibly as to lock the screw. Before mounting, apply grease.
- (3) Visually align the optical axes of the instrument and single lens reflex camera.
- (4) Adjust the focus by the front lens at the telephoto-end of zoom by turning the concave helicoid after fixing the distance ring 0.8 mm before the infinity stopper.
- (5) Loosen screw (a).
- (6) Set the zoom to W end and move the relay lens back and forth to set the focus.
- (7) Repeat the steps (4) and (6) to eliminate focus maladjustments at T and W ends.
- (8) Block the relay lens and make sure the focus is not maladjusted.
- (9) Make sure the distance ring is positioned 8 mm before the infinite stopper and bond the distance ring and concave helicoid with alonalpha.
- * Note: Do not apply the adhesives excessively. Do not apply other than the illustrated points. (Never apply the AF cam surface (D).) Do not apply force for 5 minutes after application.

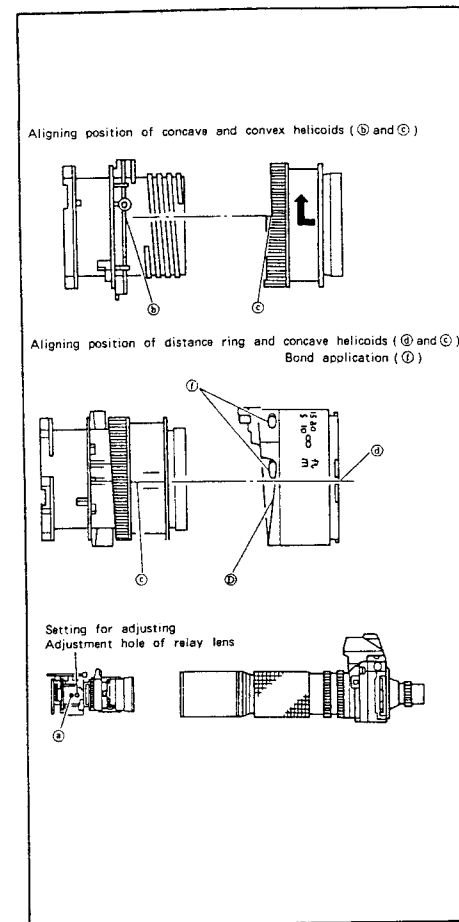


Fig. II-62

5. Electrical Adjustments (Camera Section)

* Notes: 1. For adjustment from 5-4 through 5-21, set the camera service mode (6). See "3-4 Service modes".

2. Be sure to perform the data writing by pressing the REC key, after the data setting.
3. In automatic adjustment, perform just the writing operation.
4. Exit the service mode, and power OFF the camera section once and then power it ON. Otherwise, its operation will not reflect the stored electrical adjustment data.

5-1 Clock frequency adjustment

M. EQ.	Frequency counter Note: Connect via an oscilloscope.
TP/TRIG.	SP P.C.B. TP1002 (CSP2)
ADJ.	SP P.C.B. VC1001 (CLOCK)
SPEC.	E200, 400E ... 4.828125 MHz \pm 15 Hz E600E 6.437500 MHz \pm 15 Hz

5-2 PLL adjustment

M. EQ.	Digital voltmeter
TP/TRIG.	SP P.C.B. TP1003 (PLL)
ADJ.	SP P.C.B. VC1002 (PLL)
SPEC.	2.5 \pm 0.2 V

5-3 DM-PLL (E400, 600E only)

M. EQ.	Digital voltmeter
TP/TRIG.	C-KEY P.C.B. TP1501 (PLL)
ADJ.	C-KEY P.C.B. VC1501 (PLL)
SPEC.	2.5 \pm 0.1 V

5-4 Vsub voltage adjustment

CHART	Window chart (5600°K)
MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1102 (S/H OUT)/ TP1001 (FH/2)
ADJ.	B701 (Vsub voltage adjustment data address)
SPEC.	1200 \pm 20 mV

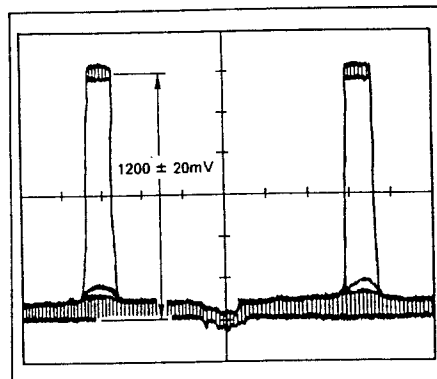


Fig. II-63

5-5 OB set adjustment

CHART	Lens capped
MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1101 (YH)/ TP1001 (FH/2)
ADJ.	B702 (OB set adjustment data address)
SPEC.	0 \pm 10 mV

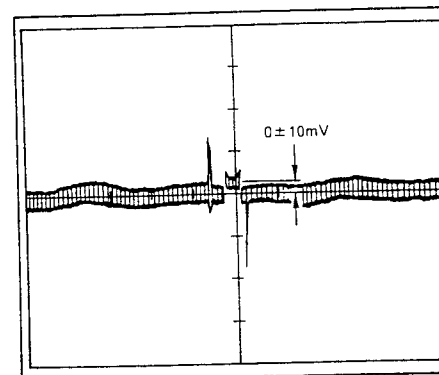


Fig. II-64

5-6 Auto iris adjustment

CHART	Grayscale (5600°K)
MODE	Service mod <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1102 (S/H OUT)/ TP1001 (FH/2)
ADJ.	B703 (Auto iris adjustment data address)
SPEC.	400 \pm 10 mV

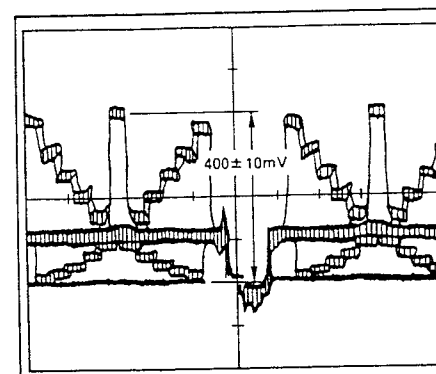


Fig. II-65

5-7 Y AGC adjustment

CHART	Grayscale 5600°K
MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1108 (Y OUT)/ TP1001 (FH/2)
ADJ.	B704 (Y AGC adjustment data address)
SPEC.	330 \pm 10 mV

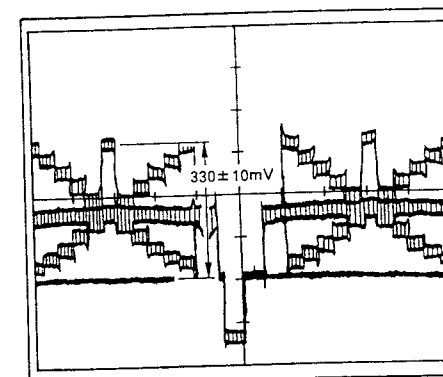


Fig. II-66

5-8 1/2 fH color difference adjustment

CHART	Lens capped
MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1110 (COH)/ TP1001 (FH/2)
ADJ.	B705 (1/2 fH color difference adjustment data address)
SPEC.	Difference of every 1H must be 0 \pm 10 mV

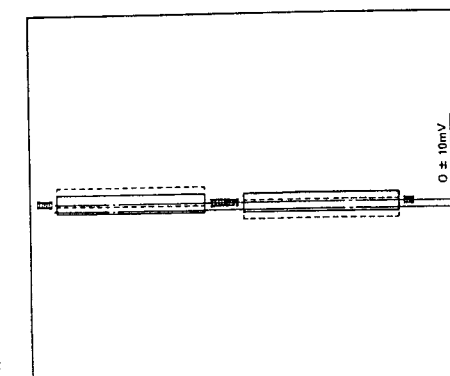


Fig. II-67

5-9 Chroma offset adjustment

CHART	Lens capped
MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1110 (C0H)/ TP1001 (FH/2)
ADJ.	B706 (Chroma offset adjustment data address)
SPEC.	Difference between blanking and video signal must be 0 ± 10 mV.

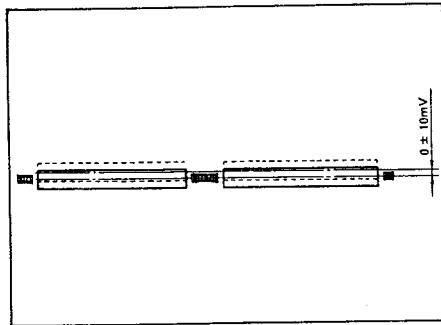


Fig. II-68

5-10 C1 gain adjustment

CHART	Color bar chart
MODE	Service mode <6>
M. EQ.	Vectorscope
TP/TRIG.	VIDEO OUT
ADJ.	B707 (C1 level adjustment data address)
SPEC.	Superimpose individual bright dots upon one another. Tolerances are: Phase; 5° Gain; 10%

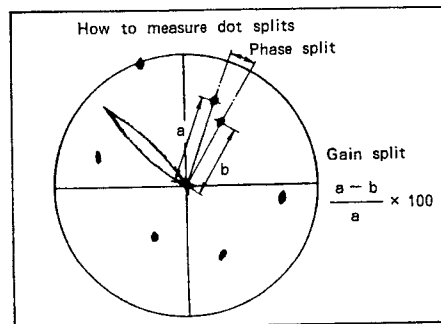


Fig. II-69

5-11 Carrier balance adjustment

CHART	Lens capped
MODE	Service mode <6>
M. EQ.	Vectorscope
TP/TRIG.	VIDEO OUT
ADJ.	B708 (Carrier balance R-Y adjustment data address) B709 (Carrier balance B-Y adjustment data address)
SPEC.	Each dots (dark) must be centered

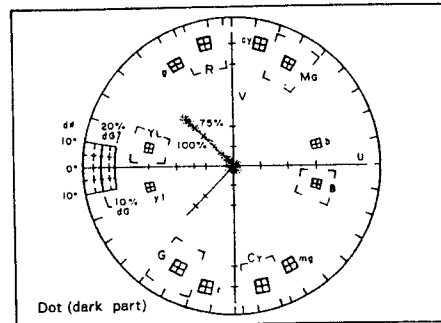


Fig. II-70

5-12 Burst phase adjustment

MODE	Service mode <6>
M. EQ.	Vectorscope
TP/TRIG.	VIDEO OUT
ADJ.	B70A (Burst phase adjustment data address)
SPEC.	$135 \pm 2^\circ$

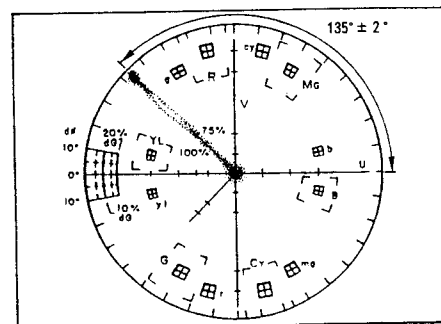


Fig. II-71

5-13 Burst level adjustment

MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1113 (C OUT)/ TP1001 (FH/2)
ADJ.	B70B (Burst level adjustment data address)
SPEC.	150 ± 10 mV

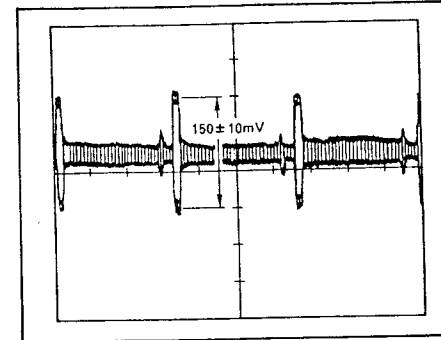


Fig. II-72

5-14 White balance adjustment (1)

CHART	Light box (5600°K)
MODE	Service mode <6>
M. EQ.	Vectorscope
TP/TRIG.	VIDEO OUT
ADJ.	B70C (5600°K R contrast adjustment data address) B70D (5600°K B contrast adjustment data address)
SPEC.	Bright dots must be centered.

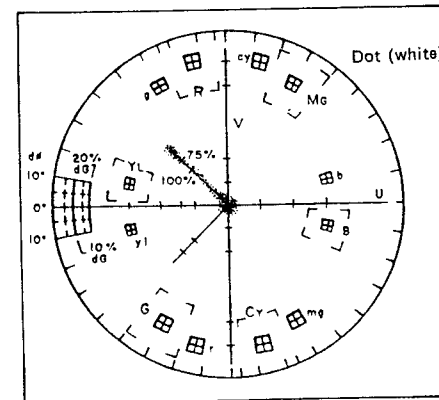


Fig. II-73

5-15 White balance set adjustment

CHART	Light box (5600°K)
MODE	Service mode <6>
M. EQ.	Vectorscope
ADJ.	B70E (White balance set adjustment data address)
SPEC.	Automatic adjustment

5-16 Black adjustment

CHART	Lens capped
MODE	Service mode <6>
M. EQ.	Vectorscope
ADJ.	B70F (Black adjustment data address)
SPEC.	Automatic adjustment

* Note: During the adjustments 5-15/5-16, check the bright dots (white for 5-15, dark for 5-16) if centered. If not, perform the 5-11 and 5-14 again.

5-17 Color balance adjustment

CHART	Color bar
MODE	Service mode <6>
M. EQ.	Vectorscope
ADJ.	B710 (R-Y gain adjustment data address) B711 (B-Y gain adjustment data address) B712 (R-Y matrix adjustment data address) B713 (B-Y matrix adjustment data address)
SPEC.	Color Phase Gain (relative to burst level) R $106 \pm 2^\circ$ 1.65 ± 0.1 times Ye $166 \pm 2^\circ$ 1.10 ± 0.1 times

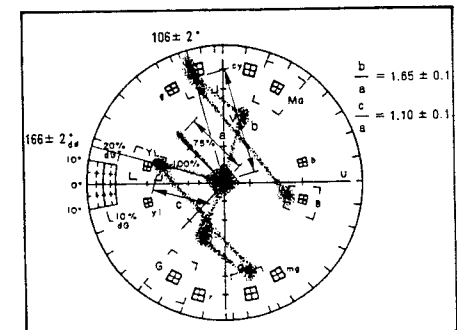


Fig. II-74

* Remarks: "Color balance check"

To check the color balance by using the complete product in normal mode, refer to the following ratings.

Before shooting the color bar chart (5600°K) at this check, lock the white balance by using a 5600°K light box.

	Color phase	Gain
R	109 ± 5°	1.65 ± 0.2 times
Ye	171 ± 7°	1.20 ± 0.2 times
G	244 ± 8°	-

5-18 White balance adjustment (2)

CHART	Light box (5600°K) + CCA12
MODE	Service mode <6>
M. EQ.	Vectorscope
TP/TRIG.	VIDEO OUT
ADJ.	B714 (3200°K R contrast adjustment data address) B715 (3200°K B contrast adjustment data address)
SPEC.	Bright dots be centered.

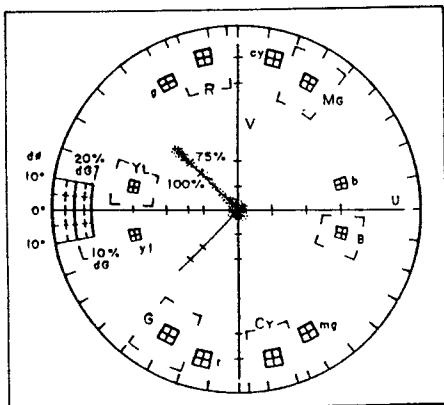


Fig. II-75

* Note: Before the adjustment of 3200°K R contrast, shift the data address to B715, set the CCA12 filter, and then set it back to B714.

5-19 3200°K white balance reference adjustment

CHART	Light box (5600°K) + CCA12
MODE	Service mode <6>
ADJ.	B716 (3200°K white balance reference adjustment data address)
SPEC.	Automatic adjustment.

5-20 5600°K white balance reference adjustment

CHART	Light box (5600°K)
MODE	Service mode <6>
ADJ.	B717 (5600°K white balance reference adjustment data address)
SPEC.	Automatic adjustment.

5-21 White clip adjustment

CHART	Window chart
MODE	Service mode <6>
M. EQ.	Oscilloscope
TP/TRIG.	SP P.C.B. TP1108 (Y OUT)/ TP1001 (FH/2)
ADJ.	B719 (white clip adjustment data address)
SPEC.	400 ± 10 mV

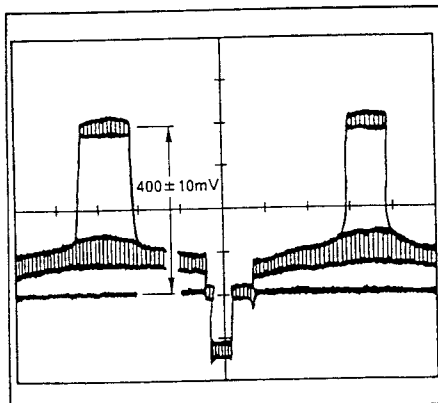
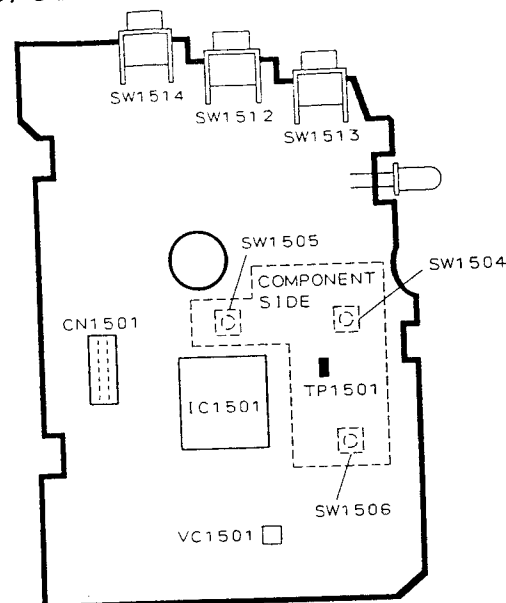


Fig. II-76

Locations of TP/VR/VC

CAMERA-KEY P.C.B. (E400, 600E ONLY)



SP P.C.B.

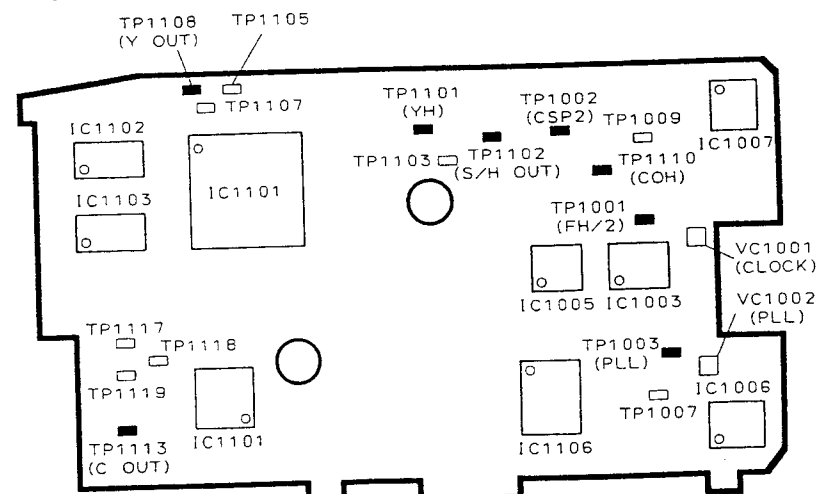


Fig. II-77

6. Electrical Adjustments of Recorder Section

Preparation before Adjustments in REC/EE Mode

Tools/Equipments to be prepared:

- Y/C Separator DY9-1093-500
- Pattern Generator
- Input Cable DY9-1282-000

Procedures:

- (1) Connect the VIDEO OUT terminal of Pattern Generator to the INPUT terminal of Y/C Separator. Then, connect the OUTPUT terminal of Y/C Separator to the CN109 of VS P.C.B. using the input cable.
- (2) Supply the voltage to the Y/C Separator from the 6V Constant Voltage Supplier, and set the Y/C select switch to "C".
- (3) Supply a colorbar signal from the Pattern Generator to the Y/C Separator.
- (4) Observe the signal waveform at pin 4 of CN109 (VS P.C.B.).
- (5) Adjust the DC level at the synchronizing tip to $1.8 \sim 1.9$ V by the VR201 of Y/C Separator. (A in the figure below)
- (6) Set the Y/C select switch to "Y".
- (7) Observe the signal waveform at pin 3 of CN109 (VS P.C.B.).
- (8) Adjust the DC level at the synchronizing tip to $2.0 \sim 2.1$ V by the VR202 of Y/C Separator. (B in the figure below)
- (9) Set the Y/C select switch to "C". (Then, you can supply the video signal for the adjustments in REC/EE mode!)

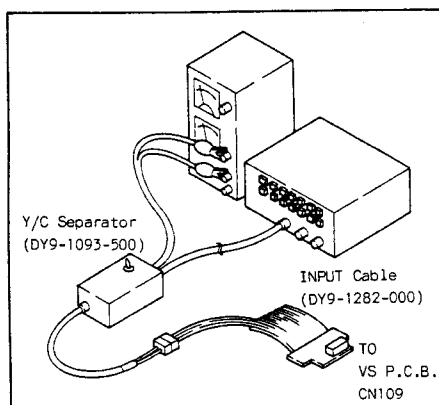


Fig. II-78-1

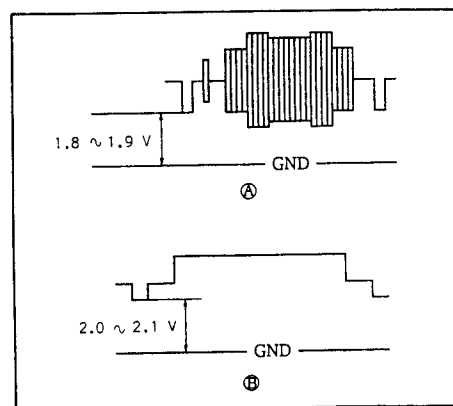


Fig. II-78-2

6-1 Under adjustment

MODE	Service mode <3>, EE
M. EQ.	Digital voltmeter
TP/TRIG.	Battery terminal
ADJ.	INSUFFICIENT VOLTAGE
SPEC.	5.65 ± 0.10 V -0.05 V

Procedures:

- (1) Supply 6 V to the battery terminal of completed status of product to energize it.
- (2) Select the service mode display <3>, INSUFFICIENT VOLTAGE.
- (3) Adjust the battery terminal voltage to 5.65 V and press the REC key.
- (4) After recording for 3 sec. or more, push the C-RESET button.

Then, push the REC key to write the voltage into microcomputer, and push the C-RESET key to change it to the data of insufficient voltage.

6-2 SS 5V adjustment

MODE	EE
M. EQ.	Digital voltmeter
TP/TRIG.	VS P.C.B. IC100 pin 8
ADJ.	VS P.C.B. VR100 (SS-5V)
SPEC.	5.1 ± 0.05 V

6-3 Switching point adjustment

SIGNAL	Alignment tape E (Monosco) (DY9-1062-000)
MODE	Service mode <3>, PB
ADJ.	(PG DL)
SPEC.	7.0 ± 1 H

Procedures:

- (1) Set the service mode <3> PG DL in STOP mode.
- (2) Playback the alignment tape E (Monosco).
- (3) Push the C-RESET button to write it into memory.

6-4 Video 5V adjustment

MODE	EE
M. EQ.	Digital voltmeter
TP/TRIG.	VS P.C.B. IC451, pin 8
ADJ.	VS P.C.B. VR451 (VIDEO 5V)
SPEC.	5.1 ± 0.05 V

6-5 REC AGC adjustment

SIGNAL	100% white video signal
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC501, pin 7
ADJ.	VS P.C.B. VR501 (REC AGC)
SPEC.	0.5 ± 0.02 Vp-p

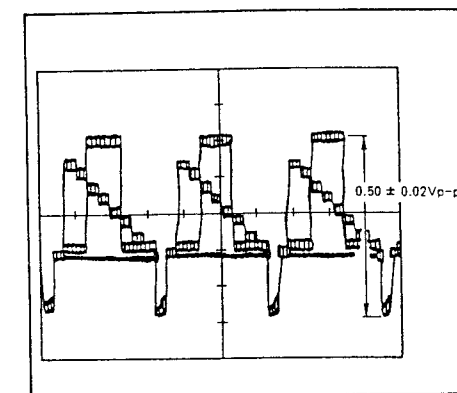


Fig. II-79

20 μsec/0.1 V

6-6 REC Y level adjustment

SIGNAL	100% white video signal
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC501, pin 3
ADJ.	VS P.C.B. VR544 (REC Y LEVEL)
SPEC.	0.50 ± 0.02 Vp-p

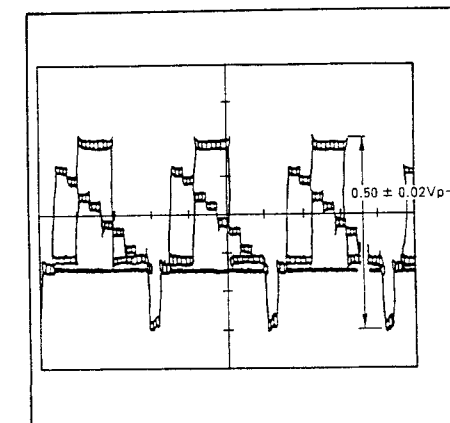


Fig. II-80

20 μsec/0.1 V

6-7 Y/C separation adjustment

SIGNAL	100% white video signal
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC501, pin 11
ADJ.	VS P.C.B. VR612, VR502 (Y/C SEP.)
SPEC.	Minimize the chroma component.

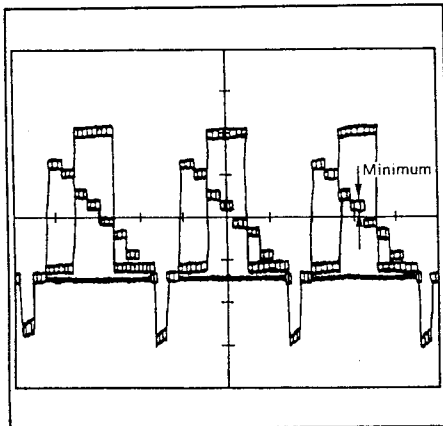


Fig. II-81 20 μ sec/0.1 V

6-8 Y FM carrier adjustment

SIGNAL	No signal (Option terminal)
MODE	REC
M. EQ.	Frequency counter
	Note: Connected via an oscilloscope.
TP/TRIG.	VS P.C.B. IC501, pin 43
ADJ.	VS P.C.B. VR503 (Y CAR)
SPEC.	4.38 \pm 0.02 MHz

6-9 Y FM deviation adjustment

SIGNAL	100% white video signal
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC501, pin 43
ADJ.	VS P.C.B. VR504 (Y DEV.)
SPEC.	0.37 sec/2 cycle (5.4 MHz)

* Note: Observe a signal wave whose period is shortest.

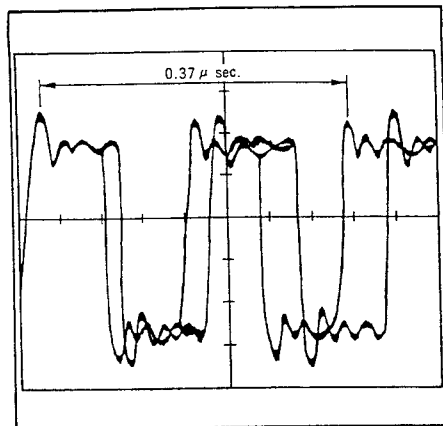


Fig. II-82 50 nsec/0.1 V

6-10 Recording current Y adjustment

SIGNAL	No signal (terminal open)
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC401, pin 24
ADJ.	VS P.C.B. VR401 (REC Y)
SPEC.	300 \pm 5 mVp-p

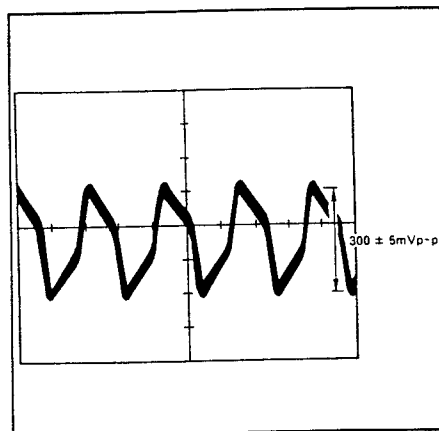


Fig. II-83 0.1 μ sec/0.1 V

* Note: On the measured waveform, other signals (noises) are superposed. Measure the waveform amplitude at the center of waveform line.

6-11 Recording current C adjustment

SIGNAL	Color bar signal
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC401, pin 24
ADJ.	VS P.C.B. VR402 (REC C)
SPEC.	65 \pm 5 mVp-p

Procedures:

- Connect the following pin and points to ground.
 - Pin 5 (REC Y) of Q570
 - Point (A) (REC AUDIO) of VR403
 - Point (B) (REC ATF) of VR404
- Adjust the waveform to the specified value.

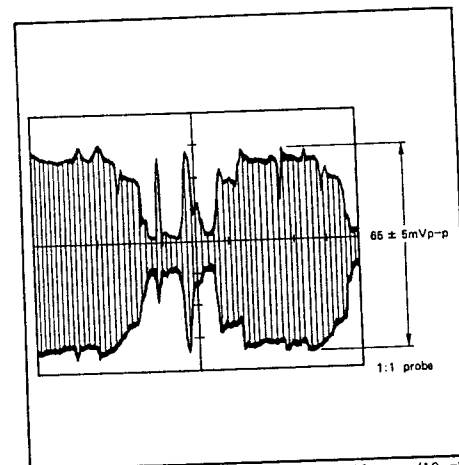


Fig. II-84 10 μ sec/10 mV

6-12 Recording current AUDIO adjustment

SIGNAL	No signal (terminal open)
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC401, pin 24
ADJ.	VS P.C.B. VR403 (REC A-FM)
SPEC.	26 \pm 5 mVp-p

Procedures:

- Connect the following pins and resistor to ground.
 - Pin 5 (REC Y) of Q570
 - Pin 4 (REC C) of Q672
 - Pin 3 (REC ATF) of Q111
- Adjust the waveform to the specified value.

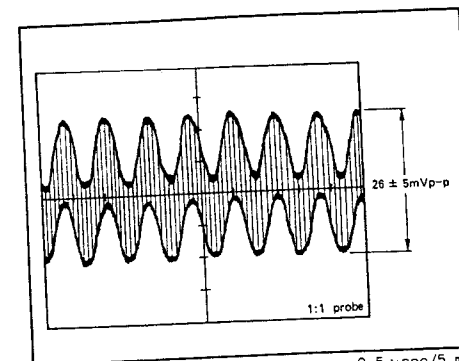


Fig. II-85 0.5 μ sec/5 mV

6-13 Recording current ATF adjustment

SIGNAL	No signal (terminal open)
MODE	REC
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC401, pin 24
ADJ.	VS P.C.B. VR404 (REC ATF)
SPEC.	36 \pm 2 mVp-p

Procedures:

- Connect the following pins to ground.
 - E200E, E400E
 - Pin 5 (REC Y) of Q570
 - Pin 4 (REC C) of Q672
 - Pin 2 (REC AUDIO) of Q806 (AUDIO P.C.B.)
 - E600E
 - Pin 2 (REC Y) of Q570
 - Pin 4 (REC C) of Q672
 - Pin 2 (REC AUDIO) of Q904 (AUDIO P.C.B.)
- Adjust the waveform to the specified value.

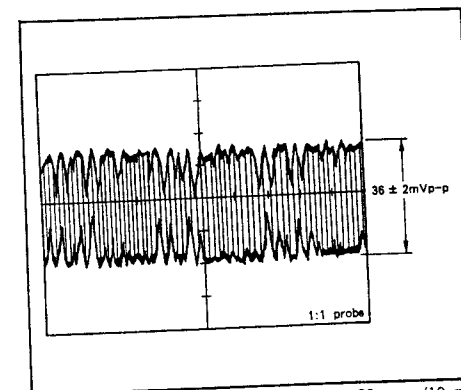


Fig. II-86 20 μ sec/10 mV

6-14 Playback (PB) Y level adjustment

SIGNAL	Color bar signal (REC/PB)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. IC501, pin 3
ADJ.	VS P.C.B. VR542 (PB Y LEVEL)
SPEC.	500 ± 20 mVp-p

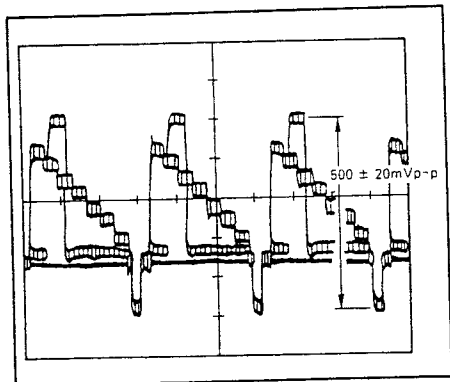


Fig. II-87 20 μ sec/0.1 V

6-15 Playback (PB) AGC adjustment

SIGNAL	Color bar signal (REC/PB)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	VS P.C.B. CM452, pin 19
ADJ.	VS P.C.B. VR543 (PB AGC)
SPEC.	1.00 ± 0.05 Vp-p

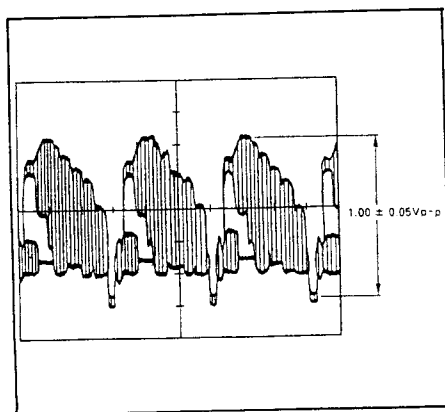


Fig. II-88 20 μ sec/0.2 V

6-16 Character position of character generator adjustment

SIGNAL	Color bar signal
MODE	REC
M. EQ.	Monitor TV
ADJ.	VS P.C.B. VC471 (CG SIZE)
SPEC.	Position the right side of rightmost digit of counter on the border between black and blue bars.

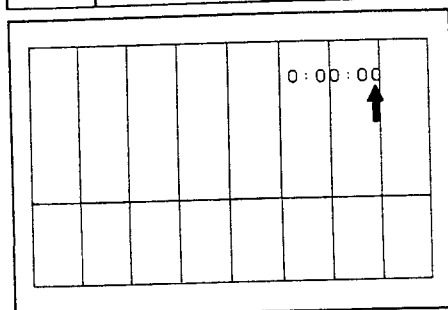


Fig. II-89

6-17 JOG chrominance phase adjustment

SIGNAL	Color bar signal (REC/PB)
MODE	SEARCH
M. EQ.	Monitor TV
ADJ.	VS P.C.B. VR475 (JOG BURST)
SPEC.	Reduce black noise bars appearing under each white noise bars as possible.

6-18 FM audio carrier adjustment (E200E, E400E only)

SIGNAL	Alignment tape (STEREO) (DY9-1292-500)
MODE	PB
M. EQ.	Oscilloscope, Monitor TV
TP/TRIG.	AUDIO P.C.B. (E200E, E400E) IC802, pin 4
ADJ.	AUDIO P.C.B. (E200E, E400E) VR801 (A-CAR.)
SPEC.	Make two waveforms of pin 4 overlap, and adjust it to a sine waveform.

Procedures:

- (1) Connect the pin 4 of IC802 (Audio P.C.B.) to ground via a resistor of 10 Kohms.
- (2) Playback the alignment tape.
- (3) Observe the waveform at pin 4 of Audio P.C.B. while monitoring the playback sound.
- (4) If the waveform is not clear (doubled, etc.) and/or there is a noise in playback sound, adjust the VR801 to make the waveform as shown in the Fig. II-89.

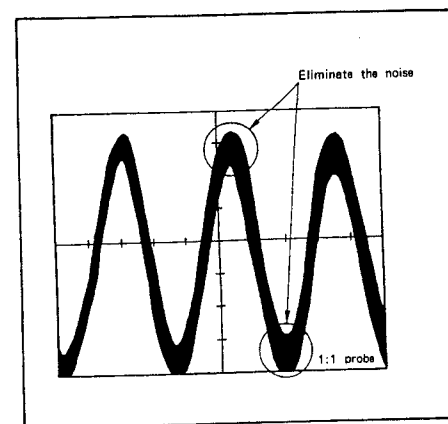


Fig. II-90 0.5 μ sec/5 mV

6-19 FM audio deviation adjustment (E200E, E400E only)

* Note: Be sure to perform 6-17 Carrier adjustment before this adjustment. Connect the pin 19 of IC802 (AUDIO P.C.B.) to ground via a resistor of 10 Kohms.

SIGNAL	Alignment tape E (Monosco) (DY9-1062-000)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	AUDIO P.C.B. IC802, pin 19
ADJ.	AUDIO P.C.B. VR802 (A DEV.)
SPEC.	1 ± 0.05 Vp-p

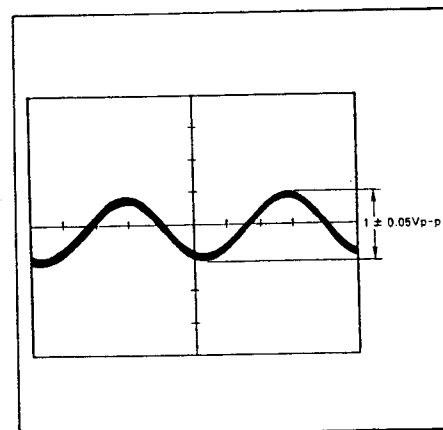


Fig. II-91 0.5 msec/0.5 V

6-20 Recording matrix (AUDIO) adjustment (E600E only)

SIGNAL	3 kHz/40 mVp-p
MODE	REC
M. EQ.	Oscilloscope, Frequency oscillator
TP/TRIG.	AUDIO P.C.B. IC903, pin 3
ADJ.	AUDIO P.C.B. VR902 (REC MAT.)
SPEC.	Minimize peak-to-peak value

Procedures:

- (1) Apply the signal of 3 kHz/40 mVp-p to IC903, pin 28, pin 36 from the frequency oscillator, and record the lines.
- (2) Adjust AUDIO P.C.B. VR902 so that the peak-to-peak value of IC903, pin 3 (AUDIO P.C.B.) becomes minimal.

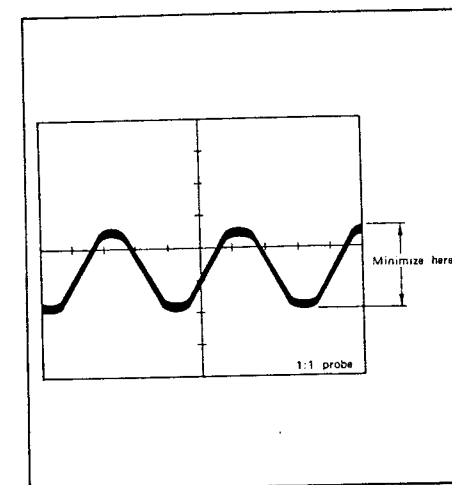


Fig. II-92 5 msec/20 mV

6-21 Playback matrix (AUDIO) adjustment (E600E only)

SIGNAL	3 kHz/40 mVp-p
MODE	REC/PB
M. EQ.	Oscilloscope, Frequency oscillator
TP/TRIG.	AUDIO P.C.B. IC903, pin 4
ADJ.	AUDIO P.C.B. VR901 (PB MAT)
SPEC.	Minimize peak-to-peak value.

Procedures:

- (1) Apply the signal of 3 kHz/40 mVp-p to the IC801, pin 36 only and record the line.
- (2) Playback the above portion recorded and adjust VR901 (AUDIO P.C.B.) so that the peak-to-peak value of the IC903, pin 4 (AUDIO P.C.B.) becomes minimal.

- * Notes:
1. Before the adjustment, perform the Recording matrix adjustment (6-19).
 2. Be sure to insert a pin into the Rch terminal when performing this adjustment.

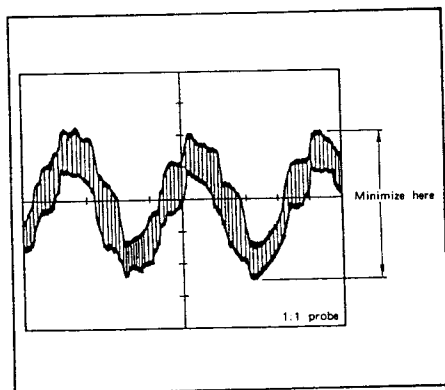


Fig. II-93 10 msec/10 mV

6-22 Carrier (AUDIO) adjustment (E600E only)

SIGNAL	Alignment tape (STEREO) (DY9-1292-500)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	AUDIO P.C.B. IC801, pin 6, pin 44(Lch) AUDIO P.C.B. IC802, pin 6, pin 44(Rch)
ADJ.	AUDIO P.C.B. VR801 (Lch) AUDIO P.C.B. VR802 (Rch)
SPEC.	0%

Procedures:

- (1) Playback the alignment tape (Stereo).
- (2) Monitor the playback sound and observe the potential difference between the pins 6 and 44 of IC801 (AUDIO P.C.B.).
- (3) Adjust the VR801 in such a way that the playback sound is normal (there is no howling sound, etc.) and that there is no potential difference.
- (4) Observe the pin 6 and 44 of IC802 (AUDIO P.C.B.) in the same manner as in 2 and 3, and then adjust them with the VR802.

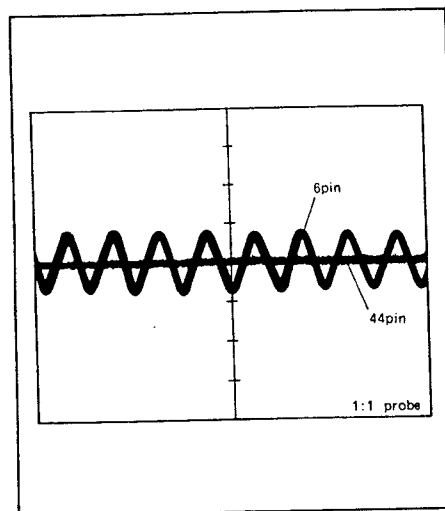


Fig. II-94 2 msec/0.2 V

6-23 Deviation (AUDIO) adjustment (E600E only)

SIGNAL	Alignment tape (STEREO) (DY9-1929-500)
MODE	PB
M. EQ.	Oscilloscope
TP/TRIG.	IC903, pin 27 (1.5 MHz PB DEV.) IC903, pin 1 (1.7 MHz PB DEV.)
ADJ.	AUDIO P.C.B. VR803, VR804 (DEV)
SPEC.	3.4 ± 0.5 Vp-p

- * Notes:
1. Be sure to do this by always inserting a pin into the Rch terminal.
 2. Before the adjustment, perform the carrier (AUDIO) adjustment. (6-21)

7. EVF Adjustment

7-1 Free run frequency adjustment

SIGNAL	No signal (terminal open)
MODE	EE
M. EQ.	Oscilloscope, frequency counter
TP/TRIG.	GRIP P.C.B. TP1953 (HD)
ADJ.	GRIP P.C.B. VR1902 (H. PHASE)
SPEC.	15.90 ± 0.05 KHz

7-2 Vertical amplitude adjustment

SIGNAL	Object of circle
MODE	EE
M. EQ.	EVF, Monitor TV
ADJ.	GRIP P.C.B. VR1901 (V-SIZE)
SPEC.	Compare with monitor TV picture. Sense of strangeness is not allowed.

Procedures:

- (1) Shoot an object of circle (which allows to check vertical distortion) and adjust the field angle to the full screen.
- (2) Compare the monitor TV picture and EVF picture and adjust VR1901 so there will be no sense of strangeness.

7-3 Rotation and centering adjustment

MODE	EE
M. EQ.	EVF
ADJ.	Deflection yoke, centering magnet
SPEC.	Picture must not tilt and be centered on screen.

Procedures:

- (1) Shoot an object which allows to check the picture verticality and centering.
 - (2) Loosen the fastening ring so the deflection yoke can be moved.
 - (3) Rotate the deflection yoke to eliminate a picture tilt.
- * Note: Tighten it to such a degree that the centering magnet can just be moved.
- (4) Tighten the fastening ring.
- * Note: Tighten it to such a degree that the centering magnet can just be moved.
- (5) Move the centering magnet so the picture will be centered.
 - (6) Definitely tighten the fastening ring.
- * Note: Do not tighten excessively.
- (7) Apply paint, etc. at 2 opposite points on the centering magnet to lock.

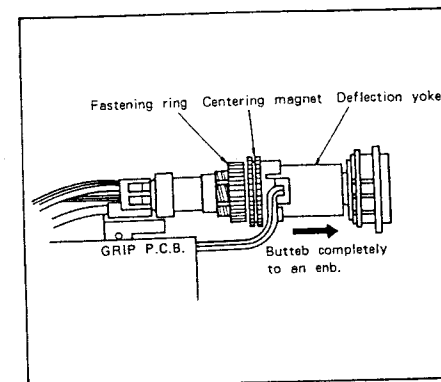


Fig. II-95

7-4 Brightness adjustment

SIGNAL	Self recording playback tape (grayscale)
MODE	PLAY
M. EQ.	EVF
ADJ.	GRIP P.C.B. VR1904 (BRIGHT)
SPEC.	Up to 11th shade of grayscale must be discernible.

7-5 Focus adjustment

MODE	Lens-capped (character indication)
M. EQ.	EVF
ADJ.	GRIP P.C.B. VR1903 (FOCUS)
SPEC.	EVF character focus must be optimum.

8. Recorder Mechanism

For disassembly, reassembly and adjustment of recorder mechanism, refer to MC-40 service manual (DY8-3391-505 201). The following explains precautions and additional items for the instrument.

8-1 Running adjustment

At the basic setting status, select the service mode <2> or <4>.

Connect extension cable q to check PB-RF, SWP.

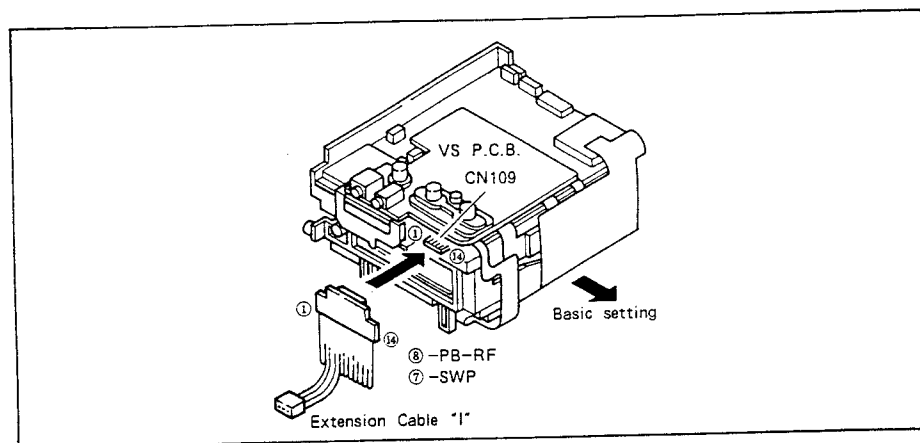
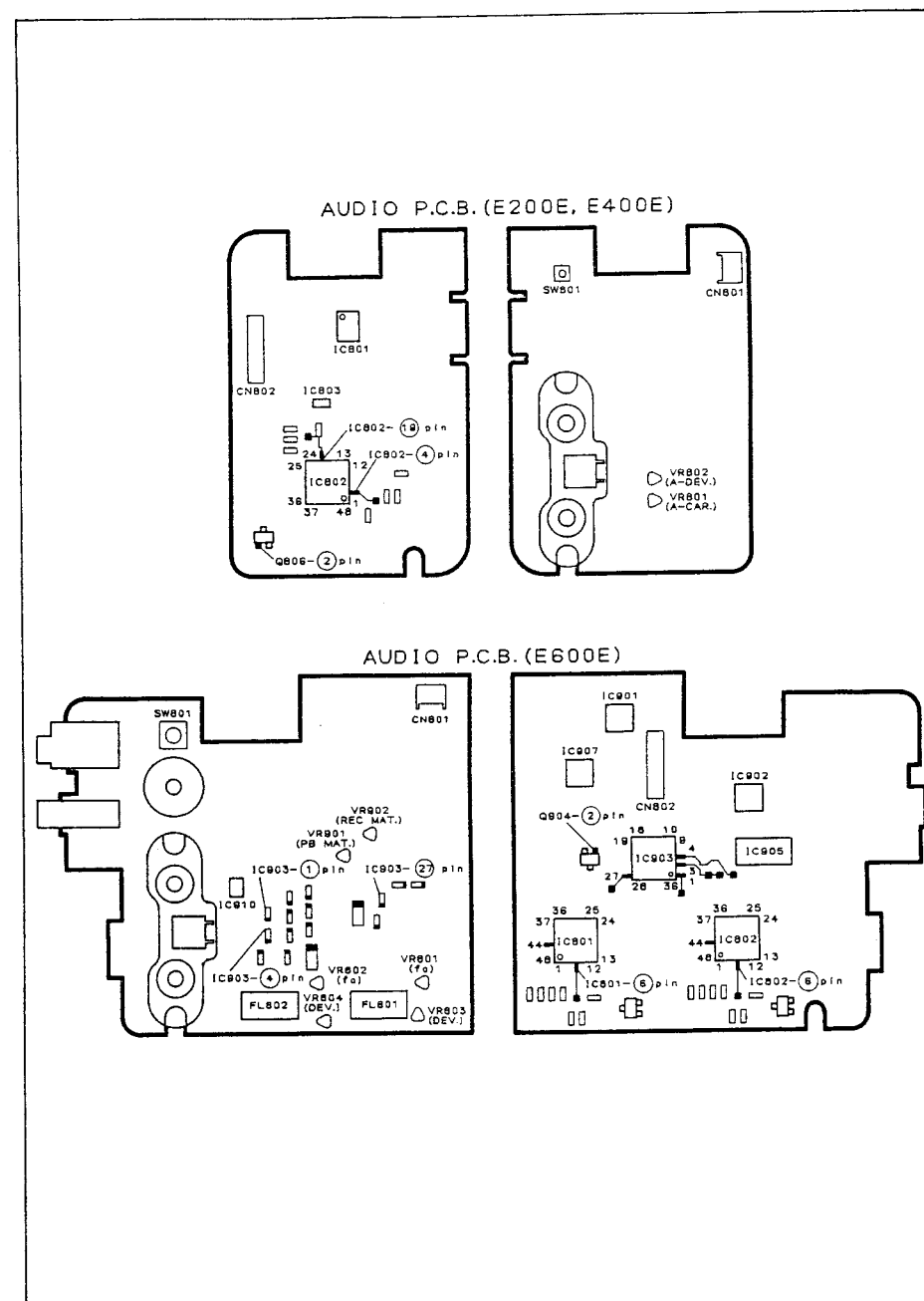
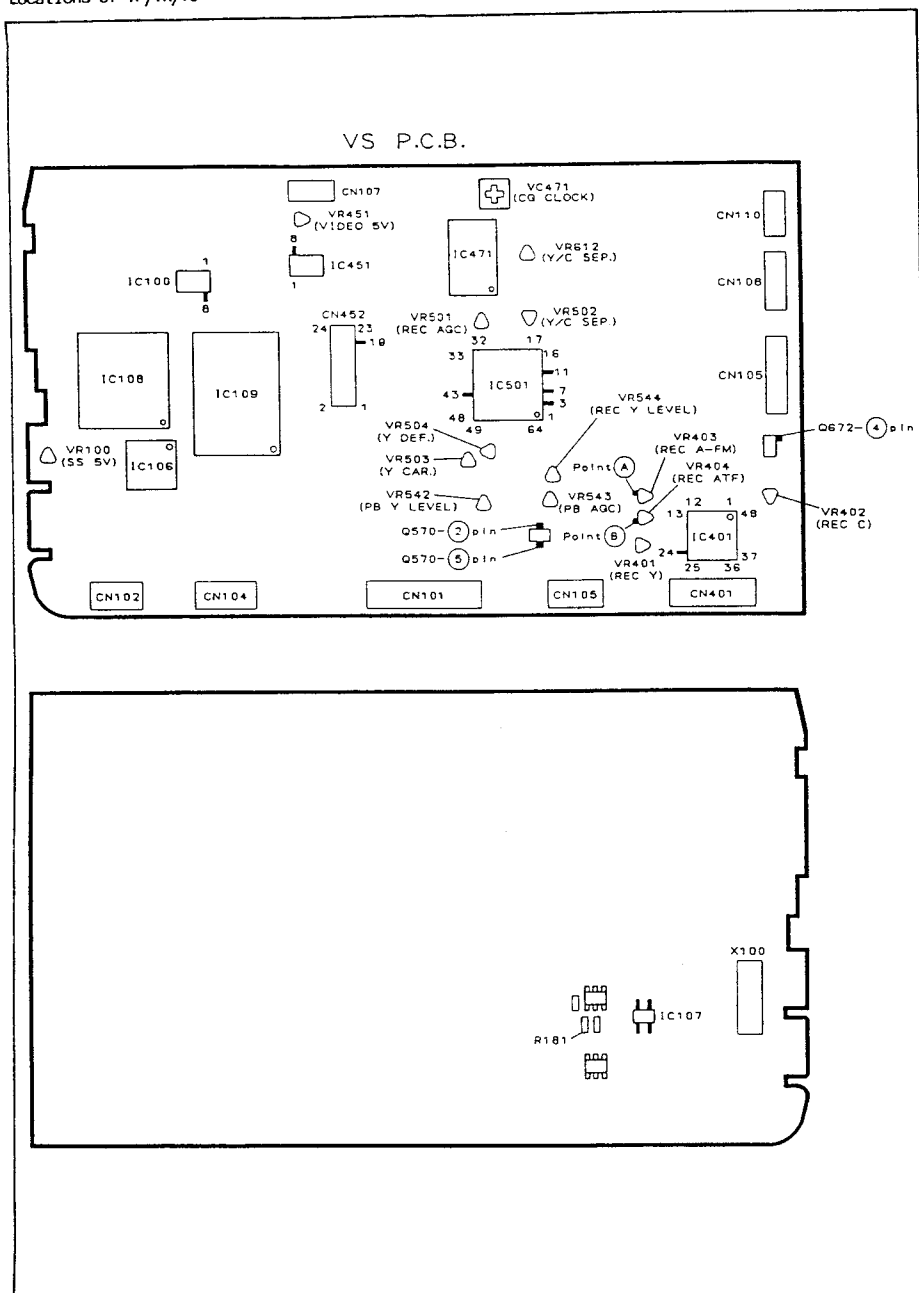


Fig. II-96



Locations of TP/VR/VC



9. Adjustments after Replacement of Main Parts

Replacement of any main part must be followed by at least the adjustments listed in the table below. Note that some other adjustments may be necessitated by replacement of more than one main part or development of certain faults.

Table II-4 (1/2)

Adjustment: Marked with o. Confirmation: Marked with Δ.

No.	Main part name	CCD	SP P.C.B.	C-KEY P.C.B.	CAMERA MI-COM	MAIN MI-COM	VS P.C.B.	SERVO MI-COM	AUDIO P.C.B.	GRIP P.C.B.	UPPER DRUM
5-1	Clock frequency adjustment		Δ								
5-2	PLL adjustment		Δ								
5-3	DM-PLL (E400E, E600E only)			Δ							
5-4	V SUB voltage adjustment	o	o		o						
5-5	OB set adjustment	o	o		o						
5-6	Auto iris adjustment	o	o		o						
5-7	Y AGC adjustment	o	o		o						
5-8	1/2 FH color different adjustment	o	o		o						
5-9	Chroma offset adjustment	o	o		o						
5-10	C1 gain adjustment	o	o		o						
5-11	Carrier balance adjustment	o	o		o						
5-12	Burst phase adjustment		o		o						
5-13	Burst level adjustment	Δ	o		o						
5-14	White balance adjustment (1)	o	o		o						
5-15	White balance set adjustment	o	o		o						
5-16	Black adjustment	o	o		o						
5-17	Color balance adjustment	o	o		o						
5-18	White balance adjustment (2)	o	o		o						
5-19	3200°K white balance reference adjustment	o	o		o						
5-20	5600°K white balance reference adjustment	o	o		o						
5-21	White clip adjustment	o	o		o						
6-1	Undercut adjustment		o		o		o	o			
6-2	SS 5V adjustment						Δ				o
6-3	Switching point adjustment						Δ				
6-4	Video 5V adjustment						Δ				
6-5	REC AGC adjustment						Δ				
6-6	REC Y level adjustment						Δ				
6-7	Y/C separation adjustment						Δ				
6-8	Y FM carrier adjustment						Δ				
6-9	Y FM deviation adjustment						Δ				
6-10	Recording current Y adjustment						Δ				
6-11	Recording current C adjustment						Δ				o
6-12	Recording current AUDIO adjustment						Δ				o
6-13	Recording current ATF adjustment						Δ				o
6-14	Playback (PB) Y level adjustment						Δ				Δ

Table II-4 (2/2)


Adjustment: Marked with o. Confirmation: Marked with Δ.

No.	Main part name Necessary adjustments	CCD	SP	C-KEY	CAMERA	MAIN	VS	SERVO	AUDIO	GRIP	UPPER
		P.C.B.	P.C.B.	MI-COM	MI-COM	P.C.B.	MI-COM	P.C.B.	P.C.B.	P.C.B.	DRUM
6-15	Playback (PB) AGC						Δ				Δ
6-16	Character position of character generator adjustment						Δ				
6-17	JOG chrominance phase adjustment						Δ				
6-18	FM audio carrier adjust- ment (E200E, E400E only)								Δ		
6-19	FM audio deviation adjust- ment (E200E, E400E only)								Δ		
6-20	Recording matrix (AUDIO) adjustment (E600E only)								Δ		
6-21	Playback matrix (AUDIO) adjustment (E600E only)								Δ		
6-22	Carrier (AUDIO) adjustment (E600E only)								Δ		
6-23	Deviation (AUDIO) adjust- ment (E600E only)								Δ		
7-1	Free run frequency adjust- ment									Δ	
7-2	Vertical amplitude adjust- ment									Δ	
7-3	Rotation and centering adjustment									o	
7-4	Brightness adjustment									o	
7-5	Focus adjustment									o	

CONTENTS

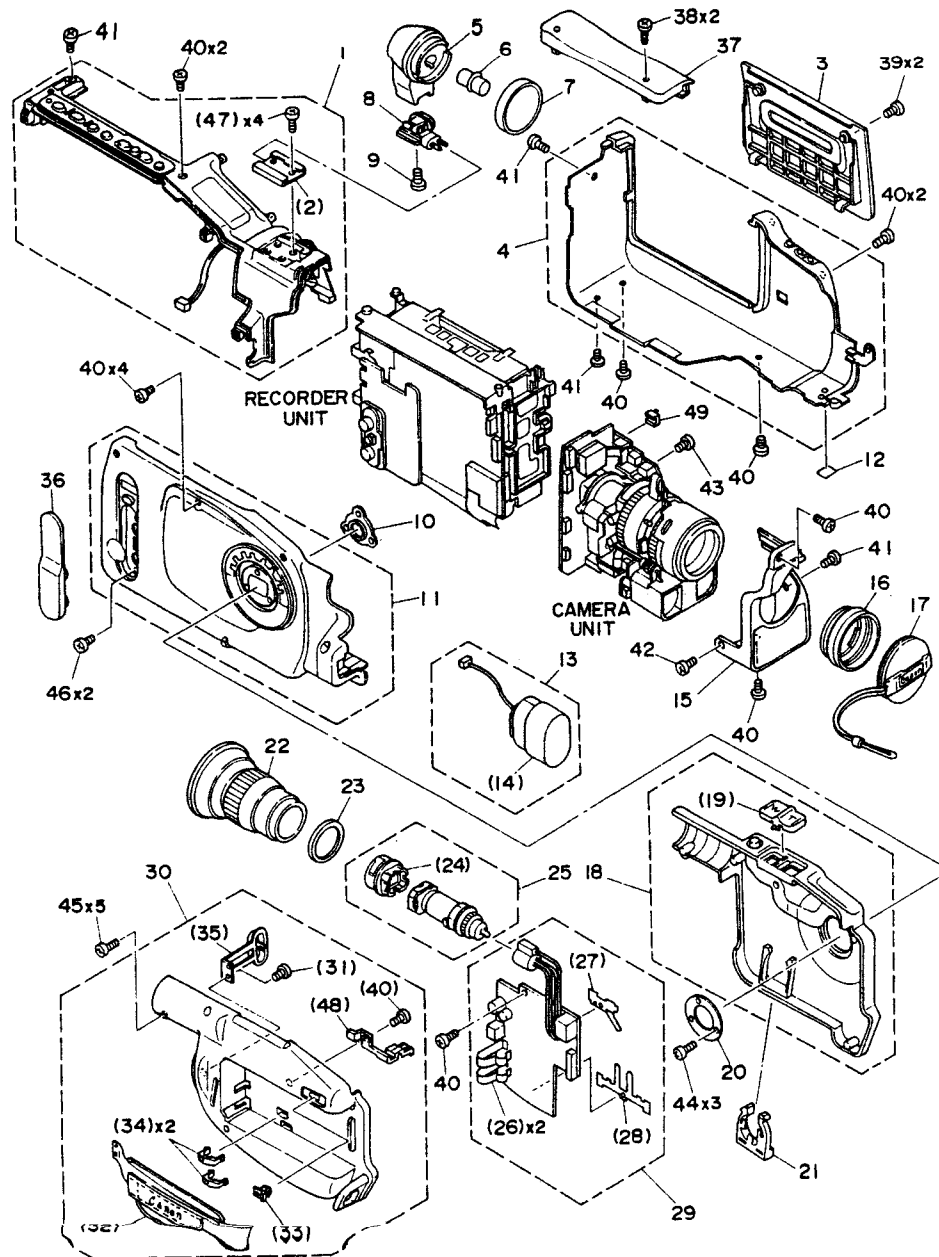
EXPLODED VIEWS	
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PARTS LIST	III - 22

CAUTION

1. ESPECIALLY CRITICAL PARTS IN THE POWER CIRCUIT BLOCK SHOULD NOT BE REPLACED WITH OTHER MARKS.
CRITICAL PARTS ARE MARKED WITH  IN THIS ELECTRICAL PARTS LIST.
2. THE NUMBERS INDICATED ON THE CONNECTORS DO NOT CORRESPOND TO THE SYMBOL NUMBERS.
PLEASE CHECK THE CORRECT SYMBOL NUMBERS OF THE CONNECTORS ON THE INTERCONNECTION SCHEMATIC DIAGRAM.
3. THE NUMBERS INDICATED IN () DENOTE THE QUANTITY FOR E600E.
(ONLY IN CASE THE QUANTITY IS NOT SAME AS E200E AND E400E)

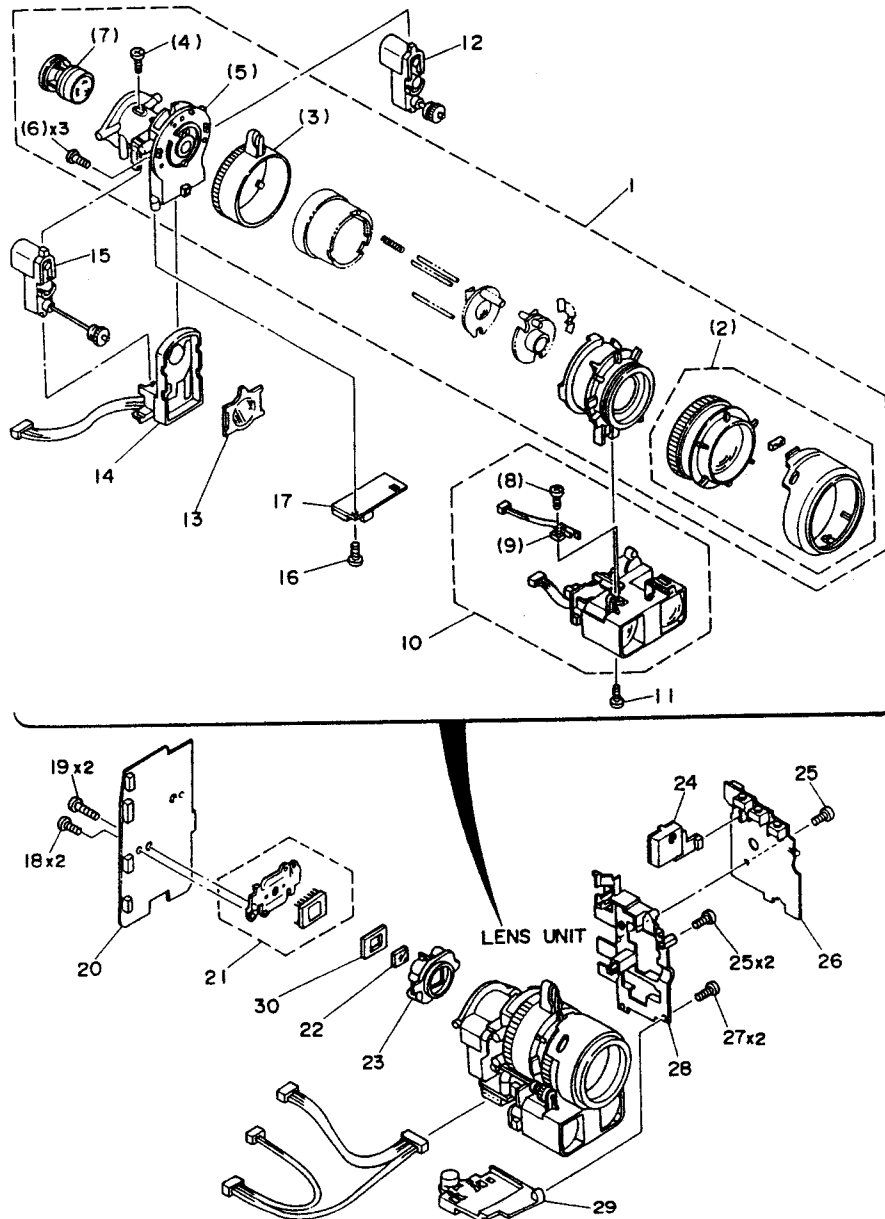
Casing Parts Section

MECHANICAL PARTS



SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY1-7347-000 000	B	1	TOP COVER ASS'Y	
2	DA1-4403-000 000	B	1	SHOE, ACCESSORY	E200E ONLY
3	DF1-1104-000 000	B	1	COVER, CASSETTE	E400E ONLY
	DF1-1106-000 000	B	1	COVER, CASSETTE	E600E ONLY
	DF1-1108-000 000	B	1	COVER, CASSETTE	
4	DG1-1968-000 000	B	1	RIGHT COVER ASS'Y	E200E ONLY
	DG1-1963-000 000	B	1	RIGHT COVER ASS'Y	E400E ONLY
	DG1-1970-000 000	B	1	RIGHT COVER ASS'Y	E600E ONLY
5	DY4-2980-000 000	B	1	COVER, LIGHT	
6	DY2-1303-000 000	B	1	LAMP, HALOGEN	
7	DY4-2981-000 000	B	1	HOLDER, FRONT	
8	DY4-2983-000 000	B	1	SHOE, LIGHT	
9	DY4-2982-000 000	F	1	SCREW	
10	DA1-3986-000 000	C	1	PLATE(2), GRIP	E200E, 400E ONLY
11	DY1-7348-000 000	B	1	LEFT COVER ASS'Y	E600E ONLY
	DY1-7349-000 000	B	1	LEFT COVER ASS'Y	
12	DA1-4586-000 000	C	1	SEAL, RIGHT COVER	E200E, 400E ONLY
13	DH9-0521-000 000	C	1	MICROPHONE ASS'Y	E600E ONLY
	DH9-0524-000 000	C	1	MICROPHONE ASS'Y	E200E, 400E ONLY
14	DY4-3080-000 000	B	1	WINDSCREEN	E600E ONLY
	DY4-3082-000 000	B	1	WINDSCREEN	
15	DG1-1869-000 000	B	1	LENS COVER ASS'Y	
16	DA1-4537-000 000	B	1	HOOD	
17	DG1-1816-000 000	B	1	CAP, LENS	
18	DY1-7324-000 000	B	1	RIGHT COVER, GRIP	
19	DA1-5346-000 000	B	1	KNOB, TELE/WIDE	
20	DA1-3985-000 000	C	1	PLATE(1), GRIP	
21	DA1-5376-000 000	B	1	COVER, BATTERY	
22	DY2-1223-000 000	B	1	SPORTS FINDER SF-200	
23	DA1-4240-000 000	B	1	RING, CRT RUBBER	
24	DA1-4751-000 000	C	1	MASK, CRT	
25	DY1-7323-000 000	D	1	CRT ASS'Y	
26	DA1-5345-000 000	C	2	TERMINAL, BATTERY	
27	DA1-3979-000 000	C	1	TERMINAL(1)	
28	DA1-3980-000 000	C	1	TERMINAL(2)	
29	DG1-1823-000 000	C	1	GRIP P.C.B. ASS'Y	
30	DG1-1960-000 000	B	1	LEFT COVER, GRIP	
31	XA9-0560-000 000	F	1	SCREW	
32	DA1-5371-000 000	B	1	STRAP, HAND	
33	DA1-4188-000 000	B	1	KNOB, BATTERY EJECT	
34	DA1-5370-000 000	B	2	CAP, SWITCH	
35	DA1-5350-000 000	B	1	LEVER, TRIGGER	
36	DA1-5344-000 000	B	1	CAP, CONNECTER	
37	DA1-5329-000 000	B	1	COVER, LS	
38	DA1-5377-000 000	F	2	SCREW	
39	XA1-7200-359 000	F	2	SCREW	
40	XA4-9200-459 000	F	14	SCREW	
41	XA4-9200-509 000	F	4	SCREW	
42	XA4-9200-409 000	F	1	SCREW	
43	DA1-4534-000 000	F	1	SCREW	
44	XA9-0521-000 000	F	3	SCREW	
45	XA4-9200-609 000	F	5	SCREW	
46	XA1-7200-509 000	F	2	SCREW	
47	XA4-8200-509 000	F	4	SCREW	
48	DA1-5349-000 000	C	1	HOOK, BATTERY	
49	DA1-5335-000 000	B	1	KNOB, TALLY	E400E, 600E ONLY

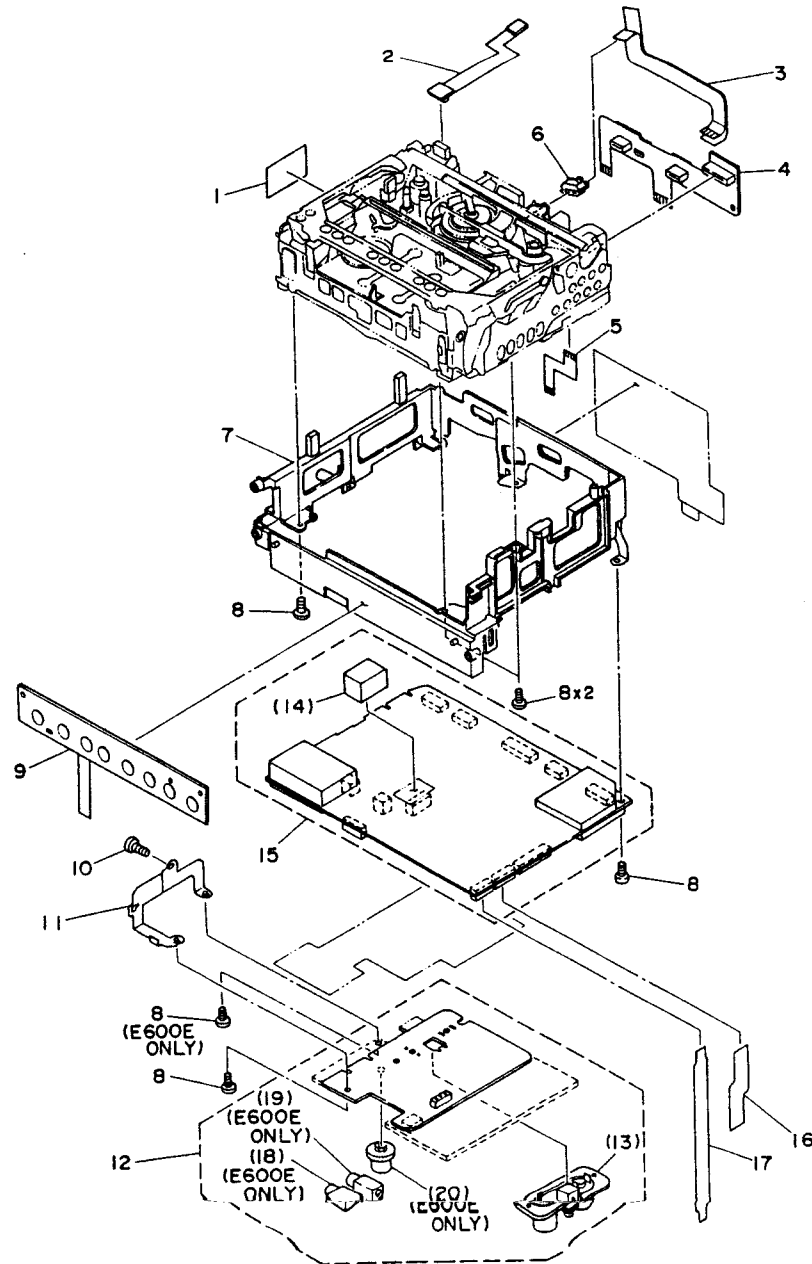
Lens / Camera Unit Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY1-7332-000 000	C	1	ZOOM LENS ASS'Y	E200E ONLY
	DY1-7337-000 000	C	1	ZOOM LENS ASS'Y	E400E ONLY
	DY1-7338-000 000	C	1	ZOOM LENS ASS'Y	E600E ONLY
2	DY1-7178-000 000	C	1	FORCUS LENS ASS'Y	E200E ONLY
	DY1-7339-000 000	C	1	FORCUS LENS ASS'Y	E400E ONLY
	DY1-7340-000 000	C	1	FORCUS LENS ASS'Y	E600E ONLY
3	DY1-7289-000 000	B	1	ZOOM RING ASS'Y	E200E ONLY
	DY1-7290-000 000	B	1	ZOOM RING ASS'Y	E400E ONLY
	DY1-7295-000 000	B	1	ZOOM RING ASS'Y	E600E ONLY
4	XB4-7260-507 000	F	1	SCREW	E200E,400E ONLY
	YA1-0661-000 000	F	1	SCREW	E600E ONLY
5	YG9-5240-000 000	C	1	RELAY HOLDER ASS'Y	E200E,400E ONLY
	DY1-7343-000 000	C	1	RELAY HOLDER ASS'Y	E600E ONLY
6	XA4-9170-557 000	F	3	SCREW	E200E ONLY
7	YG9-5095-000 000	C	1	RELAY LENS ASS'Y	E400E ONLY
	YG9-5239-000 000	C	1	RELAY LENS ASS'Y	E600E ONLY
	YG9-5248-000 000	C	1	RELAY LENS ASS'Y	E600E ONLY
8	XA4-9200-457 000	F	1	SCREW	E400E ONLY
9	YG9-5119-000 000	C	1	SWITCH, INFINITY	E600E ONLY
10	DY1-7330-000 000	C	1	AF BLOCK ASS'Y	E200E ONLY
	DY1-7344-000 000	C	1	AF BLOCK ASS'Y	E400E,600E ONLY
11	XA4-9170-607 000	F	1	SCREW	E400E,600E ONLY
12	YH7-0059-000 000	C	1	PZ MOTOR	E200E,400E ONLY
13	YN1-0235-000 000	C	1	LOW PASS FILTER	E200E,400E ONLY
14	YH8-0033-000 000	C	1	IG METER	E600E ONLY
15	YH7-0027-000 000	C	1	AF MOTOR	E200E,400E ONLY
16	XA4-4170-457 000	F	1	SCREW	E600E ONLY
17	YG9-5234-000 000	C	1	AF SUB P.C.B. ASS'Y	E200E,400E ONLY
	YG9-5292-000 000	C	1	AF SUB P.C.B. ASS'Y	E600E ONLY
18	XA9-0611-000 000	F	2	SCREW	E200E,400E ONLY
19	XA4-9201-209 000	F	2	SCREW	E400E ONLY
20	DG1-1804-000 000	C	1	CAMERA MAIN P.C.B. ASS'Y	E600E ONLY
	DG1-1833-000 000	C	1	CAMERA MAIN P.C.B. ASS'Y	E600E ONLY
	DG1-1975-000 000	C	1	CAMERA MAIN P.C.B. ASS'Y	E200E,400E ONLY
21	DY1-7350-000 000	B	1	CCD ASS'Y	E600E ONLY
	DY1-7351-000 000	B	1	CCD ASS'Y	E200E,400E ONLY
22	DH9-0540-000 000	C	1	CRYSTAL FILTER	E600E ONLY
	DH9-0526-000 000	C	1	CRYSTAL FILTER	E200E,400E ONLY
23	DA1-4501-000 000	C	1	HOLDER, CCD	E600E ONLY
	DA1-4667-000 000	C	1	HOLDER, CCD	E600E ONLY
24	DG1-1820-000 000	C	1	REMOCON P.C.B. ASS'Y	E200E ONLY
25	XA4-9200-509 000	F	3	SCREW	E400E ONLY
26	DG1-1805-000 000	C	1	CAMERA KEY P.C.B. ASS'Y	E600E ONLY
	DG1-1825-000 000	C	1	CAMERA KEY P.C.B. ASS'Y	E400E ONLY
	DG1-1977-000 000	C	1	CAMERA KEY P.C.B. ASS'Y	E600E ONLY
27	XA4-9200-459 000	F	2	SCREW	E200E ONLY
28	DA1-5311-000 000	C	1	HOLDER, (A)CAMERA	E400E ONLY
29	DA1-5378-000 000	C	1	HOLDER, (B)CAMERA	E600E ONLY
30	DA1-4720-000 000	C	1	SPACER, CCD	E600E ONLY

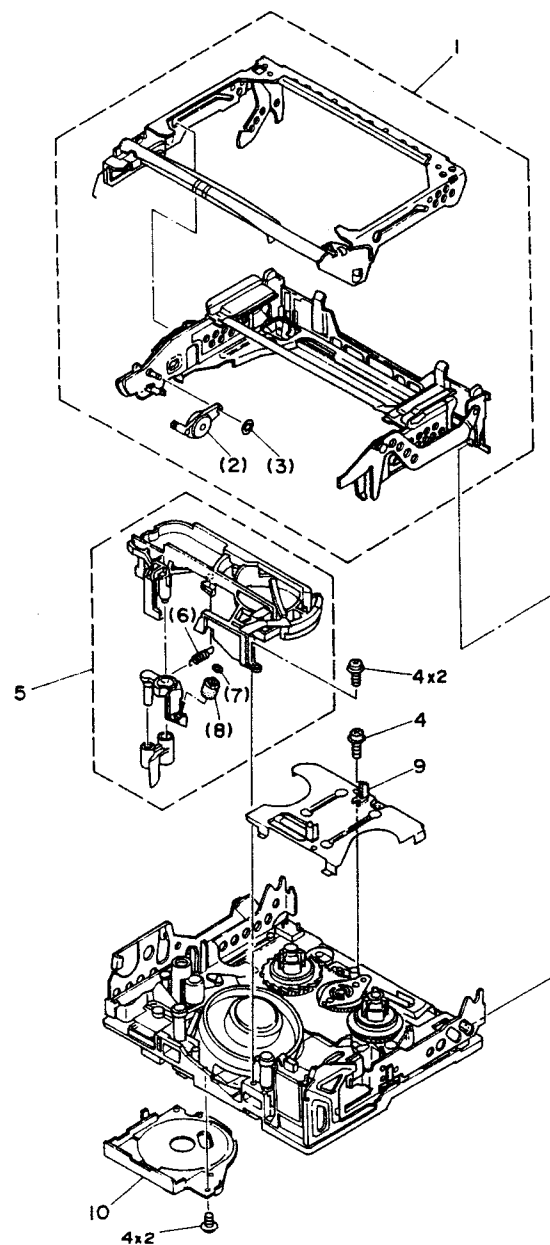
Recorder Unit Section



MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DA1-5412-000	000	C	1 LIGHT SEAL	
2	DF1-1109-000	000	C	1 PRINTED CORD ASS'Y	
3	DH2-1502-000	000	C	1 PRINTED CORD	
4	DG1-1824-000	000	C	1 PRINTED CORD ASS'Y	
5	DH2-1501-000	000	C	1 PRINTED CORD	
6	DH2-1514-000	000	C	1 CONNECTOR 11P	
7	DF1-1111-000	000	C	1 HOLDER, RECORDER	
8	XA1-7200-357	000	F	5(6) SCREW	
9	DG1-1821-000	000	C	1 RECORDER KEY	
10	XA4-9200-409	000	F	1 SCREW	
11	DA1-5317-000	000	C	1 HOLDER, AUDIO P.C.B.	
12	DG1-1834-000	000	C	1 AUDIO P.C.B. ASS'Y	E200E, 400E ONLY
	DG1-1835-000	000	C	1 AUDIO P.C.B. ASS'Y	E600E ONLY
13	DH9-0563-001	000	C	1 PIN JACK ASS'Y	E200E, 400E ONLY
	DH9-0607-000	000	C	1 PIN JACK(RF)	E600E ONLY
14	DA1-5405-000	000	C	1 RUBBER, SPONGE	
15	DY1-7352-000	000	C	1 VS P.C.B. ASS'Y	
16	DH2-1504-000	000	C	1 PRINTED CORD	
17	DH2-1505-000	000	C	1 PRINTED CORD	
18	WS6-5029-000	000	C	1 JACK, MIC	E600E ONLY
19	WS6-5001-000	000	C	1 JACK, PIN	E600E ONLY
20	DH9-0574-000	000	C	1 PIN JACK	E600E ONLY

Mechanical Chassis Section I

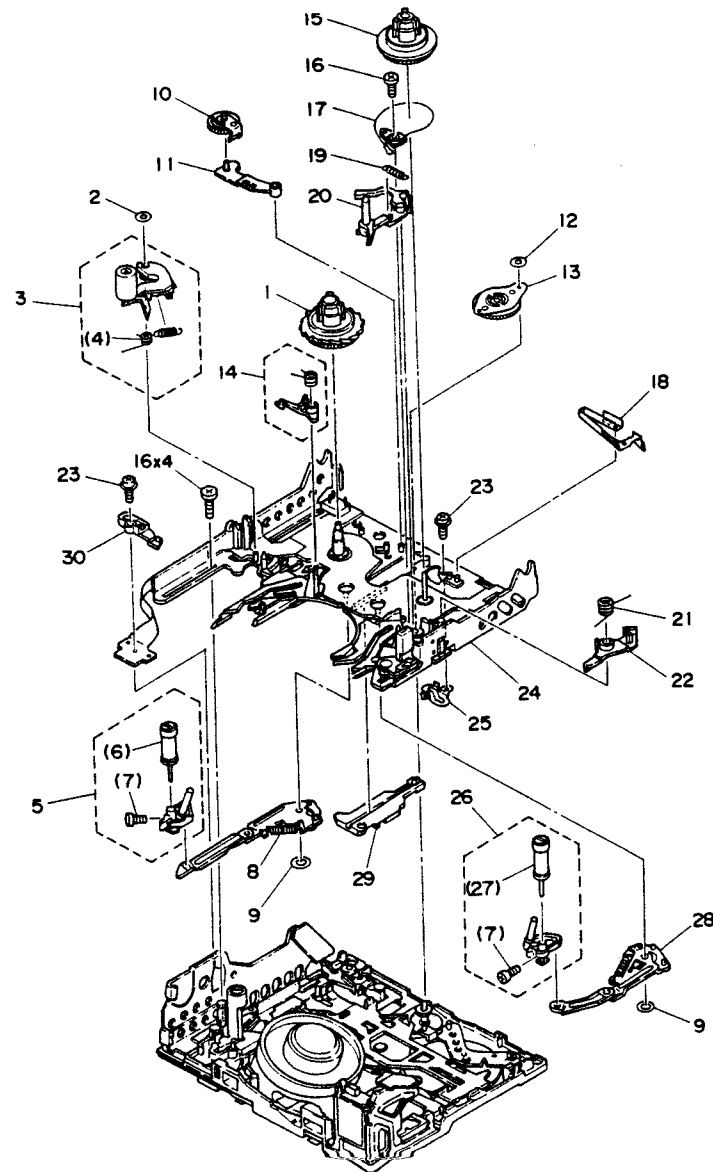


MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-3018-000 000	C	1	CASSETTE COMPARTMENT ASS'Y	
2	DY4-3040-000 000	C	1	DAMPER, CASSETTE COMPARTMENT	
3	DY4-2785-000 000	F	1	WASHER, STOPPER	
4	DY4-3075-000 000	F	5	SCREW	
5	DY4-3016-000 000	C	1	PROTECT, BASE ASS'Y	
6	DY4-3064-000 000	C	1	SPRING, TENTION	
7	DY4-2681-000 000	F	1	WASHER, STOPPER	
8	DY4-3020-000 000	C	1	ROLLER, HC	
9	DY4-3039-000 000	C	1	RETAINER, GOOSENECK	
10	DY4-3057-000 000	C	1	COVER, CAPSTAN	

Mechanical Chassis Section 2

MECHANICAL PARTS

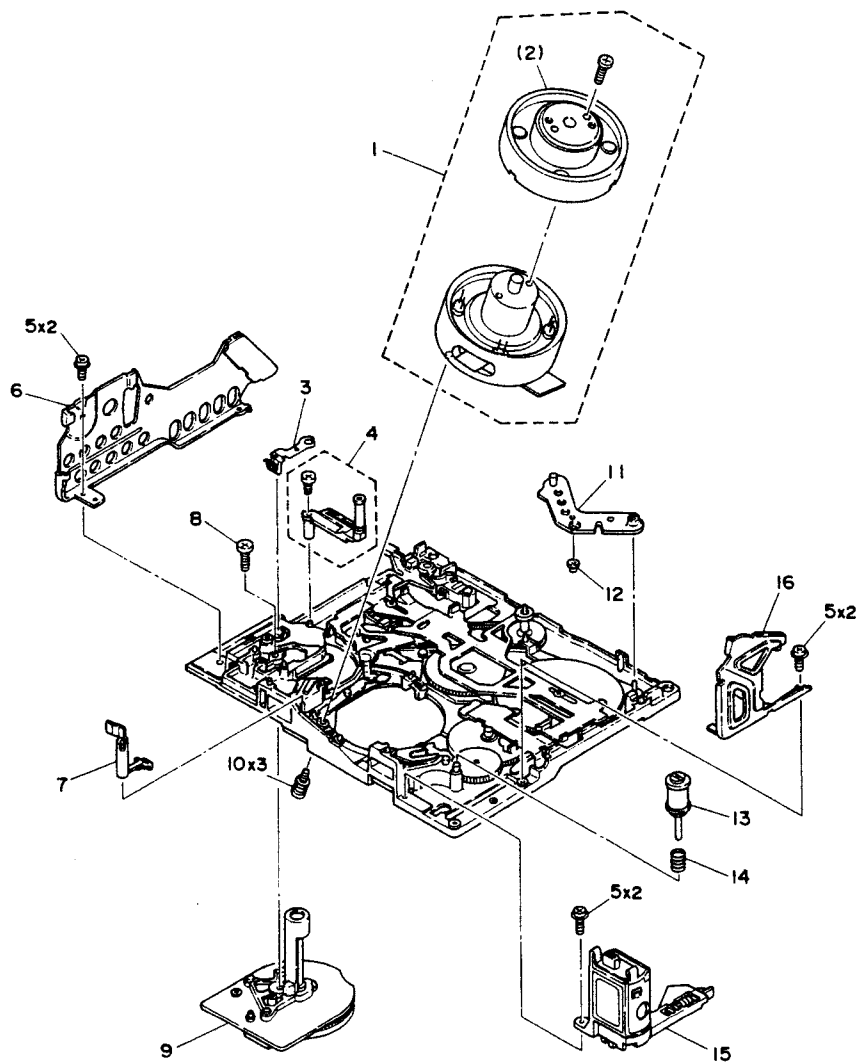


SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-3034-000 000	C	1	TABLE ASS'Y, REEL T	
2	DY4-3043-000 000	F	1	WASHER	
3	DY4-3032-000 000	C	1	ARM ASS'Y, PINCH	
4	DY4-3060-000 000	F	1	SPRING, TORSION	
5	DY4-3015-000 000	C	1	GUIDE ASS'Y, T	
6	DY4-3041-000 000	C	1	ROLLER ASS'Y, TG6	
7	DY4-3076-000 000	F	2	SCREW	
8	DY4-3030-000 000	C	1	ARM(T) ASS'Y, GUIDE	
9	DY4-2440-000 000	F	2	WASHER	
10	DY4-3033-000 000	C	1	SOFT ASS'Y, T	
11	DY4-3062-000 000	C	1	ARM, T SOFT	
12	DY4-2688-000 000	F	1	WASHER	
13	DY4-3038-000 000	C	1	GEAR, GOOSENECK	
14	DY4-3019-000 000	C	1	CLAW ASS'Y, T HARD	
15	DY4-3035-000 000	C	1	TABLE ASS'Y, REEL S	
16	DY4-3063-000 000	F	5	SCREW	
17	DY4-3037-000 000	C	1	STRING ASS'Y	
18	DY4-3072-000 000	C	1	BRAKE, S SOFT	
19	DY4-3071-000 000	C	1	SPRING, TENTION	
20	DY4-3036-000 000	C	1	TGI ASS'Y	
21	DY4-3061-000 000	F	1	SPRING, TORTION	
22	DY4-3070-000 000	C	1	BRAKE, S HARD	
23	DY4-3075-000 000	F	2	SCREW	
24	DY4-3028-000 000	C	1	CHASSIS ASS'Y, LS	
25	DY4-3069-000 000	C	1	PLATE, CAM LS	
26	DY4-3068-000 000	C	1	GUIDE BASE, S ASS'Y	
27	DY4-3031-000 000	C	1	ROLLER ASS'Y, TG3	
28	DY4-3029-000 000	C	1	ARM ASS'Y, S GUIDE	
29	DY4-3074-000 000	C	1	SLIDER, GL	
30	DY4-3077-000 000	C	1	RETAINER, TG5 BASE	

Mechanical Chassis Section 3

MECHANICAL PARTS

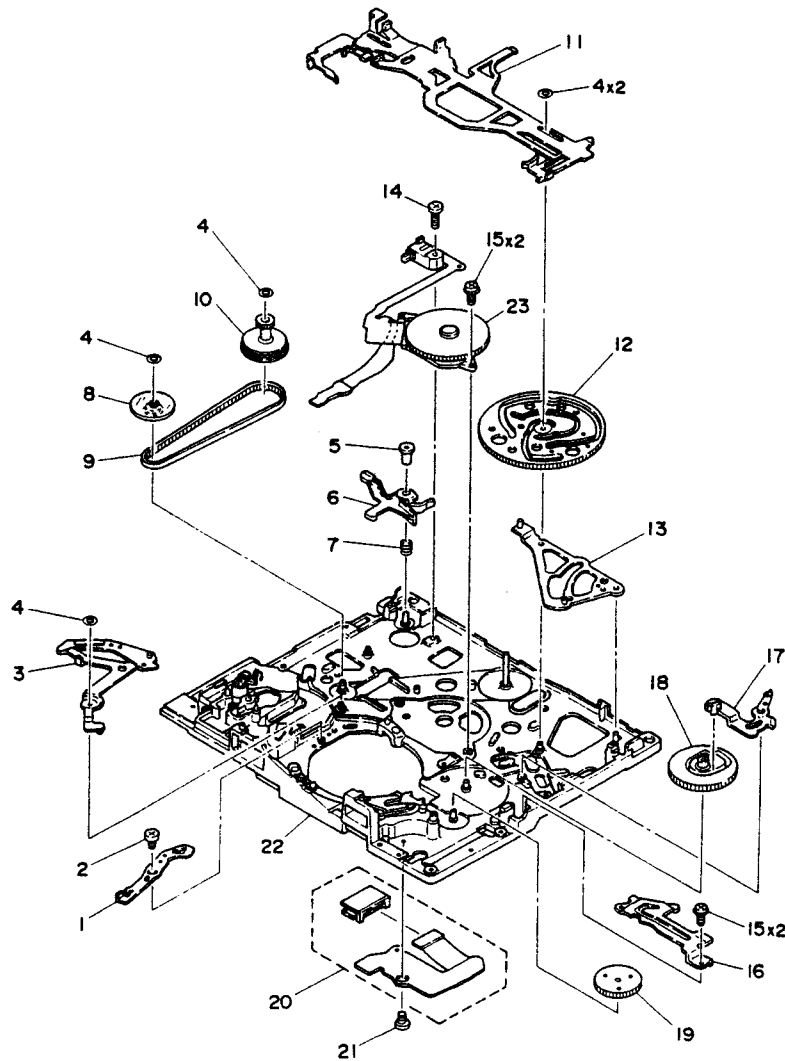
SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-3010-000 000	E	1	DRUM ASS'Y	
2	DY4-3011-000 000	E	1	DRUM ASS'Y, UPPER	
3	DY4-3073-000 000	C	1	SPRING, LEAF TG7 ARM	
4	DY4-3014-000 000	C	1	ARM ASS'Y, TG7	
5	DY4-3075-000 000	F	6	SCREW	
6	DY4-3021-000 000	C	1	PLATE(T), SIDE	
7	DY4-3059-000 000	C	1	ARM, HC CONVERSION	
8	DY4-3065-000 000	F	1	SCREW	
9	DY4-3066-000 000	E	1	MOTOR, CAPSTAN	
10	DY4-2583-000 000	F	3	SCREW	
11	DY4-3051-000 000	C	1	ARM, LS	
12	DY4-3052-000 000	C	1	ROLLER, LS	
13	DY4-3027-000 000	C	1	ROLLER, ASS'Y, TG2	
14	DY4-3067-000 000	F	1	SPRING, COMPRESSION	
15	DY4-3013-000 000	E	1	MOTOR, LOADING	
16	DY4-3046-000 000	C	1	PLATE(S), SIDE	



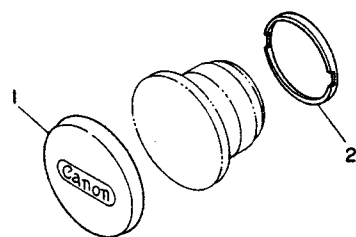
Mechanical Chassis Section 4

MECHANICAL PARTS

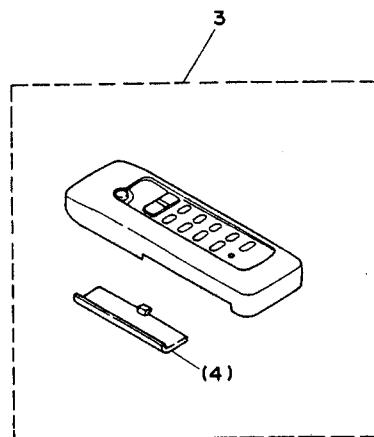
SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY4-3058-000 000	E	1	ARM, HC DRIVING	
2	DY4-2822-000 000	F	1	SCREW	
3	DY4-3025-000 000	E	1	ARM ASS'Y, PINCH PRESS	
4	DY4-2688-000 000	F	5	WASHER	
5	DY4-3056-000 000	E	1	SLEEVE, EJECT	
6	DY4-3053-000 000	E	1	LEVER, EJECT	
7	DY4-3055-000 000	F	1	SPRING, COMPRESSION	
8	DY4-3022-000 000	E	1	GEAR ASS'Y, CHANGE	
9	DY4-3045-000 000	E	1	BELT, RELAY	
10	DY4-3047-000 000	E	1	PULLEY, RELAY	
11	DY4-3026-000 000	E	1	SLIDER ASS'Y, M	
12	DY4-3048-000 000	E	1	CAM	
13	DY4-3024-000 000	E	1	ARM ASS'Y, GL	
14	DY4-3044-000 000	F	1	SCREW	
15	DY4-3075-000 000	E	4	SCREW	
16	DY4-3054-000 000	E	1	RETAINER, GEAR	
17	DY4-3023-000 000	E	1	ARM ASS'Y, FF	
18	DY4-3049-000 000	E	1	GEAR(B), L	
19	DY4-3050-000 000	E	1	GEAR(A), L	
20	DY4-3017-000 000	E	1	PRINTED CORD ASS'Y, FP444	
21	DY4-3063-000 000	F	1	SCREW	
22	DY4-3012-000 000	E	1	MAIN CHASSIS ASS'Y	
23	DY4-3042-000 000	E	1	SWITCH, ROTARY(ENCORDER)	



Accessory Parts Section



WD-37, TL-37



WL-50EXP

REF.NO.D15-5630,6030,6130

MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
1	DY3-4201-000 000	C	1	CAP, LENS	
2	DY3-4209-000 000	C	1	CAP, DUST(WD-37)	
	DY3-4210-000 000	C	1	CAP, DUST(TL-37)	
3	DY2-1379-000 000	B	1	WIRELESS REMOTO CONTROLLER WL-50EXP	
4	DY4-2984-000 000	B	1	COVER, BATTERY	

ELECTRICAL PARTS

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS	SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
△	C1912	VC7-1430-272	000	D 1	CAPACITOR, CERA 2700pF/125V	IC105	WA4-5438-000	000	B 1	IC LB8110M	
△	C1915	VC7-1360-102	000	D 1	CAPACITOR, CERA 1000pF/1KV	IC106	DH4-0135-000	000	B 1	IC CXA12040	
△	C1917	VC7-1380-152	000	D 1	CAPACITOR, CERA 1500pF/500V	IC108	DH4-0519-000	000	B 1	IC M37413M4	
	CN101	VS1-5322-016	000	C 1	CONNECTOR 16P	IC109	DH4-0518-000	000	B 1	IC CXP80116	
	CN102	WS1-5170-000	000	C 1	CONNECTOR 4P	IC401	DH4-0200-000	000	B 1	IC CXA1234AR-T3	
	CN104	VS1-5322-007	000	C 1	CONNECTOR 7P	IC402	WA3-5173-000	000	B 1	IC SC7S00FEL	
	CN106	VS1-5322-006	000	C 1	CONNECTOR 6P	IC451	WA4-5437-000	000	B 1	IC LVC556FA2	
	CN107	VS1-5447-008	000	C 1	CONNECTOR 8P	IC452	WA3-5173-000	000	B 1	IC SC7S00FEL	
	CN108	VS1-5347-012	000	C 1	CONNECTOR 12P	IC453	WA3-5173-000	000	B 1	IC SC7S00FEL	
	CN110	VS1-5447-008	000	C 1	CONNECTOR 8P	IC461	WA4-5476-000	000	B 1	IC NJM2508M	
	CN401	VS1-5322-011	000	C 1	CONNECTOR 11P	IC462	WA4-5443-000	000	B 1	IC NJM2246M	
	CN452	VS1-5336-020	000	C 1	CONNECTOR 20P	IC471	DH4-0372-000	000	B 1	IC WPD6451AGT-810	
	CN802	VS1-5269-024	000	C 1	CONNECTOR 24P	IC476	DH4-0196-000	000	B 1	IC CXA1203N	
	CN1102	VS1-5267-014	000	B 1	CONNECTOR 14P	IC501	DH4-0514-000	000	B 1	IC CXA1207AR	
	CN1103	VS1-5316-012	000	C 1	CONNECTOR 12P	IC612	DH4-0297-000	000	B 1	IC CXL1506	
	CN1501	VS1-5269-014	000	B 1	CONNECTOR 14P	IC641	DH4-0264-000	000	B 1	IC CXA1208R-T3	
	CN1502	VS1-5316-006	000	C 1	CONNECTOR 6P	IC801	WA4-5435-000	000	B 1	IC LA7454W	E600E ONLY
	CN1503	VS1-5340-003	000	C 1	CONNECTOR 3P	IC802	WA4-5435-000	000	B 1	IC LA7454W	
	CN1601	VS1-5341-003	000	C 1	CONNECTOR 3P	IC901	WA4-5507-000	000	B 1	IC NJM4580E	E200E,400E ONLY
	D100	WA1-1084-000	000	B 1	DIODE MA110	IC902	WA4-0266-000	000	B 1	IC NJM4558M	E600E ONLY
	D101	WA1-1084-000	000	B 1	DIODE MA110	IC903	WA4-5365-000	000	B 1	IC LA7456M	E600E ONLY
	D102	WA1-0961-000	000	B 1	DIODE MA112	IC906	WA3-4264-000	000	B 1	IC SC14966FEL	E600E ONLY
	D103	WA1-0961-000	000	B 1	DIODE MA112	IC907	WA4-5437-000	000	B 1	IC LVC556FA2	
	D105	WA1-1146-000	000	B 1	DIODE MA1707	IC910	WA4-5316-000	000	B 1	IC TK11447	E600E ONLY
	D106	WA1-5080-000	000	B 1	DIODE EC10QS03	IC1001	DH4-0554-000	000	B 1	IC MN5181H	E600E ONLY
	D107	WA1-1084-000	000	B 1	DIODE MA110	IC1001	WA3-5853-000	000	B 1	IC MN5151H	E200E,400E ONLY
	D108	WA1-5080-000	000	B 1	DIODE EC10QS03	IC1002	DH4-0380-000	300	B 1	IC MN5177	
	D109	WA1-0604-000	000	B 1	DIODE MA159	IC1003	WA3-6392-000	000	B 1	IC WPD16506GR	
	D110	WA1-0380-000	000	B 1	DIODE MA157	IC1005	WA4-5485-000	000	B 1	IC CXA1439M	
	D401	WA1-1164-000	000	B 1	DIODE DAN202U	IC1006	WA3-6124-000	000	B 1	IC MN3861SA-E1	E200E,400E ONLY
	D402	WA1-1164-000	000	B 1	DIODE DAN202U	IC1006	WA3-6440-000	000	B 1	IC MN3863SA	E600E ONLY
	D475	WA1-1164-000	000	B 1	DIODE DAN202U	IC1007	WA4-5437-000	000	B 1	IC LVC556FA2	
	D501	WA1-1164-000	000	B 1	DIODE DAN202U	IC1008	WA3-5241-000	000	B 1	IC SC7S04FEL	
	D502	WA1-1164-000	000	B 1	DIODE DAN202U	IC1009	WA3-5241-000	000	B 1	IC SC7S04FEL	
	D542	WA1-5061-000	000	B 1	DIODE DAP202U-T106	IC1101	DH4-0387-000	000	B 1	IC AN2180FHP	E200E,400E ONLY
	D588	WA1-0380-000	000	B 1	DIODE MA157	IC1101	DH4-0551-000	000	B 1	IC AN2181FHP	E600E ONLY
	D1001	WA1-1084-000	000	B 1	DIODE MA110	IC1102	WA3-5800-000	000	B 1	IC M62352GP-70EC	
	D1002	WA1-5091-000	000	B 1	VARIABLE CAPACITANCE DIODE 1SV205	IC1103	WA3-5800-000	000	B 1	IC M62352GP-70EC	
	D1003	WA1-1084-000	000	B 1	DIODE MA110	IC1104	WA4-1145-000	000	B 1	IC RH5VA45AA-T1	
	D1005	WA1-0962-000	000	B 1	DIODE MA121	IC1105	DH4-0406-000	000	B 1	IC LD5090	
	D1006	WA1-1153-000	000	B 1	DIODE DA204U	IC1106	WA4-5144-000	000	B 1	IC CXA1393AN	E400E,600E ONLY
	D1007	WA1-5307-000	000	B 1	DIODE MA193	IC1107	Y22-2873-000	000	B 1	IC MC68HC11A8	E200E ONLY
	D1012	WA1-5307-000	000	B 1	DIODE MA193	IC1107	Y22-2874-000	000	B 1	IC MC68HC11A8	E400E ONLY
	D1101	WA1-1084-000	000	B 1	DIODE MA110	IC1107	Y22-2874-000	000	B 1	IC MC68HC11A8	E600E ONLY
	D1103	WA1-0962-000	000	B 1	DIODE MA121	IC1501	DH4-0405-000	000	B 1	IC MSM6539	E400E,600E ONLY
	D1501	WA1-5249-000	000	B 1	DIODE 1SV223	IC1901	WA4-5428-000	000	B 1	IC BA7149F	
	D1902	WA1-1084-000	000	B 1	DIODE MA110	IC1931	WA4-5437-000	000	B 1	IC LVC556FA2	E600E ONLY
	D1903	WA1-1084-000	000	B 1	DIODE MA110	IC1941	WA4-0349-000	000	B 1	IC NJM2904M-T1	
	D1904	WA1-1123-000	000	B 1	DIODE AG01Z	△ L1902	DH9-0561-000	000	D 1	COIL, LINERRITY	
	D1942	WA1-1084-000	000	B 1	DIODE MA110	LED801	WG1-0427-000	000	B 1	LED LT1051A	
	FL801	DH6-0251-000	000	B 1	FILTER, 1.5M BPF	LED901	WG1-0427-000	000	B 1	LED LT1051A	
	FL802	DH6-0252-000	000	B 1	FILTER, 1.7M BPF	LED1531	DH9-0625-000	000	B 1	LED SLH-34VT144F	
	FL1003	DH6-0459-000	000	B 1	TRAP FILTER MXT2012S12R8	Q100	WA2-5152-000	000	B 1	TRANSISTOR 2SB1424	
	FL1101	DH6-0458-000	000	B 1	FILTER, LPS ELB-4D541N	Q101	WA2-5088-000	000	B 1	TRANSISTOR DTC114EU	
	FL1102	DH6-0464-000	000	B 1	DLF ELB-4E520N	Q102	WA2-5122-000	000	B 1	TRANSISTOR FC101	
	IC100	WA4-5437-000	000	B 1	IC LVC556FA2	Q103	WA2-1231-000	000	B 1	TRANSISTOR IMH8	
	IC101	WA4-1145-000	000	B 1	IC RH5VA45AA-T1	Q104	WA2-1378-000	000	B 1	TRANSISTOR DTC144EU	
	IC102	WA4-5272-000	000	B 1	IC MPC1710BM	Q105	WA2-1400-000	000	B 1	TRANSISTOR 2SA1576	
	IC103	WA4-5127-000	000	B 1	IC CXA8006M	Q106	WA2-1378-000	000	B 1	TRANSISTOR DTC144EU	
	IC104	WA3-6290-000	000	B 1	IC S-8420DF	Q107	WA2-5051-000	000	B 1	TRANSISTOR DTA144EU-T106	

ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
Q108	WA2-5152-000	000	B	1	TRANSISTOR 2SB1424
Q109	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q110	WA2-5152-000	000	B	1	TRANSISTOR 2SB1424
Q111	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q112	WA2-5272-000	000	B	1	TRANSISTOR IMH14
Q113	WA2-5062-000	000	B	1	TRANSISTOR DTC144TU
Q114	WA2-1231-000	000	B	1	TRANSISTOR IMH8
Q115	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q116	WA2-1235-000	000	B	1	TRANSISTOR IMB6
Q117	WA2-5272-000	000	B	1	TRANSISTOR IMH14
Q118	WA2-5062-000	000	B	1	TRANSISTOR DTC144TU
Q119	WA2-1228-000	000	B	1	TRANSISTOR IMT2
Q405	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q406	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q407	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q408	WA2-5418-000	000	B	1	TRANSISTOR DTA123EU
Q451	WA2-5149-000	000	B	1	TRANSISTOR 2SB1412F5
Q472	WA2-5347-000	000	B	1	TRANSISTOR RN2427
Q475	WA2-1198-000	000	B	1	TRANSISTOR IMD2
Q476	WA2-1230-000	000	B	1	TRANSISTOR IMH6-T108
Q477	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q478	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q479	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q480	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q481	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q504	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q505	WA2-1228-000	000	B	1	TRANSISTOR IMT2
Q506	WA2-5051-000	000	B	1	TRANSISTOR DTA144EU-T106
Q508	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q542	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q543	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q544	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q545	WA2-1238-000	000	B	1	FET 2SK209
Q546	WA2-5283-000	000	B	1	TRANSISTOR DTA144EU-T106
Q547	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q548	WA2-1231-000	000	B	1	TRANSISTOR IMH8
Q549	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q570	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q571	WA2-1235-000	000	B	1	TRANSISTOR IMB6
Q572	WA2-1235-000	000	B	1	TRANSISTOR IMB6
Q573	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q588	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q589	WA2-1407-000	000	B	1	TRANSISTOR DTC114TU-T106
Q590	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q591	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q593	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q596	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q612	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q613	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q614	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q641	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q644	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q672	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q801	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q801	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q802	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q803	WA2-0646-000	000	B	1	TRANSISTOR 2SD1328
Q804	WA2-0797-000	000	B	1	TRANSISTOR 2SA1213
Q805	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q806	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081

E400E,600E ONLY

E600E ONLY

E600E ONLY

E200E,400E ONLY

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E200E,400E ONLY

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ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
Q807	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q809	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q810	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q810	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q811	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q812	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q901	WA2-1233-000	000	B	1	TRANSISTOR IMX1-T110
Q904	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q907	WA2-1437-000	000	B	1	TRANSISTOR 2SB1121
Q1001	WA2-5169-000	000	B	1	FET 2SK880
Q1002	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q1003	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q1004	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1005	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1007	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1008	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q1009	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1010	WA2-0797-000	000	B	1	TRANSISTOR 2SA1213
Q1101	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1102	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q1103	WA2-1256-000	000	B	1	TRANSISTOR IMH5
Q1104	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q1105	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q1106	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1107	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q1108	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q1109	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q1110	WA2-1228-000	000	B	1	TRANSISTOR IMT2
Q1111	WA2-1232-000	000	B	1	TRANSISTOR IMZ1
Q1112	WA2-1234-000	000	B	1	TRANSISTOR IMX2
Q1113	WA2-1378-000	000	B	1	TRANSISTOR DTC144EU
Q1115	WA2-1337-000	000	B	1	TRANSISTOR 2SC4081
Q1116	WA2-1377-000	000	B	1	TRANSISTOR DTC143EU
Q1400	WA2-1400-000	000	B	1	TRANSISTOR 2SA1576
Q1901	WA2-0839-000	000	B	1	TRANSISTOR 2SA1226
Q1902	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
Q1904	WA2-5448-000	000	D	1	TRANSISTOR 2SC4132
Q1931	WA2-0797-000	000	B	1	TRANSISTOR 2SA1213
Q1942	WA2-5222-000	000	B	1	FET 2SK1468F
Q1943	WA2-0884-000	000	B	1	TRANSISTOR DTC144EK
Q1944	WA2-5221-000	000	B	1	TRANSISTOR 2SD1757K
Q1971	WA2-1498-000	000	B	1	TRANSISTOR 2SA1162
RR100	DH4-0144-000	000	D	1	LINK, IC ICP-F25
RR451	DH4-0142-000	000	D	1	LINK, IC ICP-F15
RR501	DH4-0144-000	000	D	1	LINK, IC ICP-F25
RR1931	DH4-0143-000	000	D	1	LINK, IC ICP-F20
RR1932	DH4-0142-000	000	D	1	LINK, IC ICP-F15
RR1933	DH4-0142-000	000	D	1	LINK, IC ICP-F15
RR1934	WD8-5005-000	000	D	1	LINK, IC D1600
RR1935	WD8-5005-000	000	D	1	LINK, IC D1600
SW1515	WC3-5044-000	000	B	1	SLIDE SWITCH SSQ-012M
SW1941	DH9-0546-000	000	C	1	SWITCH, BATTERY
SW1942	DH9-0546-000	000	C	1	SWITCH, BATTERY
T1001	DH3-0100-000	000	C	1	TRANSFORMER, DC/DC
T1901	DH9-0545-000	000	D	1	TRANSFORMER, FLYBACK
VC471	VC7-5750-300	000	C	1	CAPACITOR, TRIMMER 30pF
VC1001	VC7-5750-200	000	C	1	CAPACITOR, TRIMMER 20pF
VC1001	VC6-0340-200	000	C	1	CAPACITOR, TRIMMER 20pF
VC1002	VC7-5750-200	000	C	1	CAPACITOR, TRIMMER 20pF
VC1002	VC6-0340-200	000	C	1	CAPACITOR, TRIMMER 20pF

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ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
VC1501	VC6-0340-400 000	B	1	CAPACITOR, TRIMMER 40pF	E400E,600E ONLY
VR100	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
VR401	VR5-7780-473 000	C	1	RESISTOR, VARIABLE 47KΩ	
VR402	VR5-7780-473 000	C	1	RESISTOR, VARIABLE 47KΩ	
VR403	VR5-7780-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
VR404	VR5-7780-473 000	C	1	RESISTOR, VARIABLE 47KΩ	
VR451	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
VR475	VR5-7780-223 000	C	1	RESISTOR, VARIABLE 22KΩ	
VR501	VR5-7780-473 000	C	1	RESISTOR, VARIABLE 47KΩ	
VR502	VR5-7780-473 000	C	1	RESISTOR, VARIABLE 47KΩ	
VR503	VR5-7780-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
VR504	VR5-7780-472 000	C	1	RESISTOR, VARIABLE 4.7KΩ	
VR542	VR5-7780-471 000	C	1	RESISTOR, VARIABLE 470Ω	
VR543	VR5-7780-471 000	C	1	RESISTOR, VARIABLE 470Ω	
VR544	VR5-7780-471 000	C	1	RESISTOR, VARIABLE 470Ω	
VR612	VR5-7780-102 000	C	1	RESISTOR, VARIABLE 1KΩ	
VR801	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
VR802	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	
VR803	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	E600E ONLY
VR804	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	E600E ONLY
VR901	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	E600E ONLY
VR902	VR5-7780-103 000	C	1	RESISTOR, VARIABLE 10KΩ	E600E ONLY
VR1901	VR5-7780-101 000	C	1	RESISTOR, VARIABLE 100Ω	
VR1902	VR5-7780-333 000	C	1	RESISTOR, VARIABLE 33KΩ	
VR1903	VR7-2170-305 000	D	1	RESISTOR, VARIABLE 3MΩ/200V	
VR1904	VR7-2670-304 000	C	1	RESISTOR, VARIABLE 300KΩ	
X100	WK2-5106-000 000	C	1	QUARTZ OSCILLATOR CM309 5.8MHz	
X101	WK2-5117-000 000	C	1	QUARTZ OSCILLATOR CM309 8MHz	
X102	WK2-0303-000 000	C	1	CRYSTAL OSCILLATOR 8MHz	
X103	WK2-0508-000 000	C	1	QUARTZ OSCILLATOR CFV-308	
X641	DH9-0618-000 000	C	1	QUARTZ OSCILLATOR	E200E,400E ONLY
X1001	DH9-0609-000 000	C	1	CRYSTAL OSCILLATOR	E600E ONLY
X1001	DH9-0635-000 000	C	1	QUARTZ OSCILLATOR 25.7M0635	
X1002	DH9-0608-000 000	C	1	CRYSTAL OSCILLATOR	
X1101	WK2-0541-000 000	C	1	QUARTZ OSCILLATOR FARC4CB12M	

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
2	DA1-3979-000 000	C	1	TERMINAL(1)	
2	DA1-3980-000 000	C	1	TERMINAL(2)	
2	DA1-3985-000 000	C	1	PLATE(1), GRIP	
2	DA1-3986-000 000	C	1	PLATE(2), GRIP	
2	DA1-4188-000 000	B	1	KNOB, BATTERY EJECT	
2	DA1-4240-000 000	B	1	RING, CRT RUBBER	
2	DA1-4403-000 000	B	1	SHOE, ACCESSORY	
4	DA1-4501-000 000	C	1	HOLDER, CCD	E200E,400E ONLY
2	DA1-4534-000 000	F	1	SCREW	
2	DA1-4537-000 000	B	1	HOOD	
2	DA1-4586-000 000	C	1	SEAL, RIGHT COVER	
4	DA1-4667-000 000	C	1	HOLDER, CCD	E600E ONLY
4	DA1-4720-000 000	C	1	SPACER, CCD	
2	DA1-4751-000 000	C	1	MASK, CRT	
4	DA1-5311-000 000	C	1	HOLDER, (A)CAMERA	
6	DA1-5317-000 000	C	1	HOLDER, AUDIO P.C.B.	
2	DA1-5329-000 000	B	1	COVER, LS	
2	DA1-5335-000 000	B	1	KNOB, TALLY	E400E,600E ONLY
2	DA1-5344-000 000	B	1	CAP, CONNECTER	
2	DA1-5345-000 000	C	2	TERMINAL, BATTERY	
2	DA1-5346-000 000	B	1	KNOB, TELE/WIDE	
2	DA1-5349-000 000	C	1	HOOK, BATTERY	
2	DA1-5350-000 000	B	1	LEVER, TRIGGER	
2	DA1-5370-000 000	B	2	CAP, SWITCH	
2	DA1-5371-000 000	B	1	STRAP, HAND	
2	DA1-5376-000 000	B	1	COVER, BATTERY	
2	DA1-5377-000 000	F	2	SCREW	
4	DA1-5378-000 000	C	1	HOLDER, (B)CAMERA	
6	DA1-5405-000 000	C	1	RUBBER, SPONGE	
6	DA1-5412-000 000	C	1	LIGHT SEAL	
2	DF1-1104-000 000	B	1	COVER, CASSETTE	E200E ONLY
2	DF1-1106-000 000	B	1	COVER, CASSETTE	E400E ONLY
2	DF1-1108-000 000	B	1	COVER, CASSETTE	E600E ONLY
6	DF1-1109-000 000	C	1	PRINTED CORD ASS'Y	
6	DF1-1111-000 000	C	1	HOLDER, RECORDER	
4	DG1-1804-000 000	C	1	CAMERA MAIN P.C.B. ASS'Y	E200E ONLY
2	DG1-1805-000 000	C	1	CAMERA KEY P.C.B. ASS'Y	E200E ONLY
2	DG1-1816-000 000	B	1	CAP, LENS	
4	DG1-1820-000 000	C	1	REMOCON P.C.B. ASS'Y	
6	DG1-1821-000 000	C	1	RECORDER KEY	
2	DG1-1823-000 000	C	1	GRIP P.C.B. ASS'Y	
6	DG1-1824-000 000	C	1	PRINTED CORD ASS'Y	
4	DG1-1825-000 000	C	1	CAMERA KEY P.C.B. ASS'Y	E400E ONLY
4	DG1-1833-000 000	C	1	CAMERA MAIN P.C.B. ASS'Y	E400E ONLY
6	DG1-1834-000 000	C	1	AUDIO P.C.B. ASS'Y	E200E,400E ONLY
6	DG1-1835-000 000	C	1	AUDIO P.C.B. ASS'Y	E600E ONLY
2	DG1-1869-000 000	B	1	LENS COVER ASS'Y	
2	DG1-1960-000 000	B	1	LEFT COVER, GRIP	
2	DG1-1963-000 000	B	1	RIGHT COVER ASS'Y	E400E ONLY
2	DG1-1968-000 000	B	1	RIGHT COVER ASS'Y	E200E ONLY
2	DG1-1970-000 000	B	1	RIGHT COVER ASS'Y	E600E ONLY
4	DG1-1975-000 000	C	1	CAMERA MAIN P.C.B. ASS'Y	E600E ONLY
4	DG1-1977-000 000	C	1	CAMERA KEY P.C.B. ASS'Y	E600E ONLY
6	DH2-1501-000 000	C	1	PRINTED CORD	
6	DH2-1502-000 000	C	1	PRINTED CORD	
6	DH2-1504-000 000	C	1	PRINTED CORD	
6	DH2-1505-000 000	C	1	PRINTED CORD	
6	DH2-1514-000 000	C	1	CONNECTOR 11P	
6	DH3-0100-000 000	C	1	TRANSFORMER, DC/DC	
6	DH4-0135-000 000	B	1	IC CXA1204Q	

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
△	DH4-0142-000	000	D	3	LINK, IC ICP-F15
△	DH4-0143-000	000	D	1	LINK, IC ICP-F20
△	DH4-0144-000	000	D	2	LINK, IC ICP-F25
	DH4-0196-000	000	B	1	IC CXAL203N
	DH4-0200-000	000	B	1	IC CXAL234AR-T3
	DH4-0264-000	000	B	1	IC CXAL208R-T3
	DH4-0297-000	000	B	1	IC CXL1506
	DH4-0372-000	000	B	1	IC MPD6451AGT-810
	DH4-0380-000	300	B	1	IC MN5177
	DH4-0387-000	000	B	1	IC AN2180FHP
	DH4-0405-000	000	B	1	IC MSM6539
	DH4-0406-000	000	B	1	IC LD5090
	DH4-0514-000	000	B	1	IC CXAL207AR
	DH4-0518-000	000	B	1	IC CXP80116
	DH4-0519-000	000	B	1	IC M37413M4
	DH4-0551-000	000	B	1	IC AN2181FHP
	DH4-0554-000	000	B	1	IC MN5181H
	DH6-0251-000	000	B	1	FILTER, 1.5M BPF
	DH6-0252-000	000	B	1	FILTER, 1.7M BPF
	DH6-0458-000	000	B	1	FILTER, LPS ELB-4D541N
	DH6-0459-000	000	B	1	TRAP FILTER MXT2012S12R8
	DH6-0464-000	000	B	1	DLF ELB-4E502N
2	DH9-0521-000	000	C	1	MICROPHONE ASS'Y
2	DH9-0524-000	000	C	1	MICROPHONE ASS'Y
4	DH9-0526-000	000	C	1	CRYSTAL FILTER
4	DH9-0540-000	000	C	1	CRYSTAL FILTER
△	DH9-0545-000	000	D	1	TRANSFORMER, FLYBACK
△	DH9-0546-000	000	C	2	SWITCH, BATTERY
	DH9-0561-000	000	D	1	COIL, LINERRITY
6	DH9-0563-001	000	C	1	PIN JACK ASS'Y
6	DH9-0574-000	000	C	1	PIN JACK
6	DH9-0607-000	000	C	1	PIN JACK (RF)
	DH9-0608-000	000	C	1	CRYSTAL OSCILLATOR
	DH9-0609-000	000	C	1	CRYSTAL OSCILLATOR
	DH9-0618-000	000	C	1	QUARTZ OSCILLATOR
	DH9-0625-000	000	B	1	LED SLH-34VT144F
	DH9-0635-000	000	C	1	QUARTZ OSCILLATOR 25.7M0635
4	DY1-7178-000	000	C	1	FORCUS LENS ASS'Y
4	DY1-7289-000	000	B	1	ZOOM RING ASS'Y
4	DY1-7290-000	000	B	1	ZOOM RING ASS'Y
4	DY1-7295-000	000	B	1	ZOOM RING ASS'Y
2	DY1-7323-000	000	D	1	CRT ASS'Y
2	DY1-7324-000	000	B	1	RIGHT COVER, GRIP
4	DY1-7330-000	000	C	1	AF BLOCK ASS'Y
4	DY1-7332-000	000	C	1	ZOOM LENS ASS'Y
4	DY1-7337-000	000	C	1	ZOOM LENS ASS'Y
4	DY1-7338-000	000	C	1	ZOOM LENS ASS'Y
4	DY1-7339-000	000	C	1	FORCUS LENS ASS'Y
4	DY1-7340-000	000	C	1	FORCUS LENS ASS'Y
4	DY1-7343-000	000	C	1	RELAY HOLDER ASS'Y
4	DY1-7344-000	000	C	1	AF BLOCK ASS'Y
2	DY1-7347-000	000	B	1	TOP COVER ASS'Y
2	DY1-7348-000	000	B	1	LEFT COVER ASS'Y
2	DY1-7349-000	000	B	1	LEFT COVER ASS'Y
4	DY1-7350-000	000	B	1	CCD ASS'Y
4	DY1-7351-000	000	B	1	CCD ASS'Y
6	DY1-7352-000	000	C	1	VS P.C.B. ASS'Y
2	DY2-1223-000	000	B	1	SPORTS FINDER SF-200
2	DY2-1303-000	000	B	1	LAMP, HALOGEN
16	DY2-1379-000	000	B	1	WIRELESS REMOTO CONTROLLER WL-50EXP

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
16	DY3-4201-000	000	C	1	CAP, LENS
16	DY3-4209-000	000	C	1	CAP, DUST(WD-37)
16	DY3-4210-000	000	C	1	CAP, DUST(TL-37)
10	DY4-2440-000	000	F	2	WASHER
12	DY4-2583-000	000	F	3	SCREW
8	DY4-2681-000	000	F	1	WASHER, STOPPER
10,14	DY4-2688-000	000	F	6	WASHER
8	DY4-2785-000	000	F	1	WASHER, STOPPER
14	DY4-2822-000	000	F	1	SCREW
2	DY4-2980-000	000	B	1	COVER, LIGHT
2	DY4-2981-000	000	B	1	HOLDER, FRONT
2	DY4-2982-000	000	F	1	SCREW
2	DY4-2983-000	000	B	1	SHOE, LIGHT
16	DY4-2984-000	000	B	1	COVER, BATTERY
12	DY4-3010-000	000	E	1	DRUM ASS'Y
12	DY4-3011-000	000	E	1	DRUM ASS'Y, UPPER
14	DY4-3012-000	000	E	1	MAIN CHASSIS ASS'Y
12	DY4-3013-000	000	E	1	MOTOR, LOADING
12	DY4-3014-000	000	C	1	ARM ASS'Y, TG7
10	DY4-3015-000	000	C	1	GUIDE ASS'Y, T
8	DY4-3016-000	000	C	1	PROTECT, BASE ASS'Y
14	DY4-3017-000	000	E	1	PRINTED CORD ASS'Y, FP444
8	DY4-3018-000	000	C	1	CASSETTE COMPARTMENT ASS'Y
10	DY4-3019-000	000	C	1	CLAW ASS'Y, T HARD
8	DY4-3020-000	000	C	1	ROLLER, HC
12	DY4-3021-000	000	C	1	PLATE (T), SIDE
14	DY4-3022-000	000	E	1	GEAR ASS'Y, CHANGE
14	DY4-3023-000	000	E	1	ARM ASS'Y, FF
14	DY4-3024-000	000	E	1	ARM ASS'Y, GL
14	DY4-3025-000	000	E	1	ARM ASS'Y, PINCH PRESS
14	DY4-3026-000	000	E	1	SLIDER ASS'Y, M
12	DY4-3027-000	000	C	1	ROLLER ASS'Y, TG2
10	DY4-3028-000	000	C	1	CHASSIS ASS'Y, LS
10	DY4-3029-000	000	C	1	ARM ASS'Y, S GUIDE
10	DY4-3030-000	000	C	1	ARM (T) ASS'Y, GUIDE
10	DY4-3031-000	000	C	1	ROLLER ASS'Y, TG3
10	DY4-3032-000	000	C	1	ARM ASS'Y, PINCH
10	DY4-3033-000	000	C	1	SOFT ASS'Y, T
10	DY4-3034-000	000	C	1	TABLE ASS'Y, REEL T
10	DY4-3035-000	000	C	1	TABLE ASS'Y, REEL S
10	DY4-3036-000	000	C	1	TG1 ASS'Y
10	DY4-3037-000	000	C	1	STRING ASS'Y
10	DY4-3038-000	000	C	1	GEAR, GOOSENECK
8	DY4-3039-000	000	C	1	RETAINER, GOOSENECK
8	DY4-3040-000	000	C	1	DAMPER, CASSETTE COMPARTMENT
10	DY4-3041-000	000	C	1	ROLLER ASS'Y, TG6
14	DY4-3042-000	000	E	1	SWITCH, ROTARY(ENCORDER)
10	DY4-3043-000	000	F	1	WASHER
14	DY4-3044-000	000	F	1	SCREW
14	DY4-3045-000	000	E	1	BELT, RELAY
12	DY4-3046-000	000	C	1	PLATE (S), SIDE
14	DY4-3047-000	000	E	1	PULLEY, RELAY
14	DY4-3048-000	000	E	1	CAM
14	DY4-3049-000	000	E	1	GEAR (B), L
14	DY4-3050-000	000	E	1	GEAR (A), L
12	DY4-3051-000	000	C	1	ARM, LS
12	DY4-3052-000	000	C	1	ROLLER, LS
14	DY4-3053-000	000	E	1	LEVER, EJECT
14	DY4-3054-000	000	E	1	RETAINER, GEAR
14	DY4-3055-000	000	F	1	SPRING, COMPRESSION

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
14	DY4-3056-000	000	E 1	SLEEVE, EJECT	
8	DY4-3057-000	000	C 1	COVER, CAPSTAN	
14	DY4-3058-000	000	E 1	ARM, HC DRIVING	
12	DY4-3059-000	000	C 1	ARM, HC CONVERSION	
10	DY4-3060-000	000	F 1	SPRING, TORSION	
10	DY4-3061-000	000	F 1	SPRING, TORSION	
10	DY4-3062-000	000	C 1	ARM, T SOFT	
10,14	DY4-3063-000	000	F 6	SCREW	
8	DY4-3064-000	000	C 1	SPRING, TENTION	
12	DY4-3065-000	000	F 1	SCREW	
12	DY4-3066-000	000	E 1	MOTOR, CAPSTAN	
12	DY4-3067-000	000	F 1	SPRING, COMPRESSION	
10	DY4-3068-000	000	C 1	GUIDE BASE, S ASS'Y	
10	DY4-3069-000	000	C 1	PLATE, CAM LS	
10	DY4-3070-000	000	C 1	BRAKE, S HARD	
10	DY4-3071-000	000	C 1	SPRING, TENTION	
10	DY4-3072-000	000	C 1	BRAKE, S SOFT	
12	DY4-3073-000	000	C 1	SPRING, LEAF TG7 ARM	
10	DY4-3074-000	000	C 1	SLIDER, GL	
8,10,12,14	DY4-3075-000	000	F 17	SCREW	
10	DY4-3076-000	000	F 2	SCREW	
10	DY4-3077-000	000	C 1	RETAINER, TG5 BASE	
2	DY4-3080-000	000	B 1	WINDSCREEN	E200E,400E ONLY
2	DY4-3082-000	000	B 1	WINDSCREEN	E600E ONLY
	VC6-0340-200	000	C 2	CAPACITOR, TRIMMER 20pF	E600E ONLY
	VC6-0340-400	000	B 1	CAPACITOR, TRIMMER 40pF	E400E,600E ONLY
	VC7-1360-102	000	D 1	CAPACITOR, CERA 1000pF/1KV	
	VC7-1380-152	000	D 1	CAPACITOR, CERA 1500pF/500V	
	VC7-1430-272	000	D 1	CAPACITOR, CERA 2700pF/125V	
	VC7-5750-200	000	C 2	CAPACITOR, TRIMMER 20pF	E200E,400E ONLY
	VC7-5750-300	000	C 1	CAPACITOR, TRIMMER 30pF	
	VR5-7780-101	000	C 1	RESISTOR, VARIABLE 100Ω	
	VR5-7780-102	000	C 1	RESISTOR, VARIABLE 1KΩ	
	VR5-7780-103	000	C 4(8)	RESISTOR, VARIABLE 10KΩ	
	VR5-7780-223	000	C 1	RESISTOR, VARIABLE 22KΩ	
	VR5-7780-333	000	C 1	RESISTOR, VARIABLE 33KΩ	
	VR5-7780-471	000	C 3	RESISTOR, VARIABLE 470Ω	
	VR5-7780-472	000	C 3	RESISTOR, VARIABLE 4.7KΩ	
	VR5-7780-473	000	C 5	RESISTOR, VARIABLE 47KΩ	
	VR7-2170-305	000	D 1	RESISTOR, VARIABLE 3MΩ/200V	
	VR7-2670-304	000	C 1	RESISTOR, VARIABLE 300KΩ	
	VS1-5267-014	000	B 1	CONNECTOR 14P	E400E,600E ONLY
	VS1-5269-014	000	B 1	CONNECTOR 14P	E400E,600E ONLY
	VS1-5269-024	000	C 1	CONNECTOR 24P	
	VS1-5316-006	000	C 1	CONNECTOR 6P	
	VS1-5316-012	000	C 1	CONNECTOR 12P	
	VS1-5322-006	000	C 1	CONNECTOR 6P	
	VS1-5322-007	000	C 1	CONNECTOR 7P	
	VS1-5322-011	000	C 1	CONNECTOR 11P	
	VS1-5322-016	000	C 1	CONNECTOR 16P	
	VS1-5336-020	000	C 1	CONNECTOR 20P	
	VS1-5340-003	000	C 1	CONNECTOR 3P	
	VS1-5341-003	000	C 1	CONNECTOR 3P	
	VS1-5347-012	000	C 1	CONNECTOR 12P	
	VS1-5447-008	000	C 2	CONNECTOR 8P	
	WA1-0380-000	000	B 2	DIODE MA157	
	WA1-0604-000	000	B 1	DIODE MA159	
	WA1-0961-000	000	B 2	DIODE MA112	
	WA1-0962-000	000	B 2	DIODE MA121	
	WA1-1084-000	000	B 9	DIODE MA110	

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	WA1-1123-000	000	B 1	DIODE AG01Z	
	WA1-1146-000	000	B 1	DIODE MA707	
	WA1-1153-000	000	B 1	DIODE DA204U	
	WA1-1164-000	000	B 5	DIODE DAN202U	
	WA1-5061-000	000	B 1	DIODE DAP202U-T106	
	WA1-5080-000	000	B 2	DIODE EC10QS03	
	WA1-5091-000	000	B 1	VARIABLE CAPACITANCE DIODE 1SV205	E400E,600E ONLY
	WA1-5249-000	000	B 1	DIODE 1SV223	
	WA1-5307-000	000	B 2	DIODE MA193	
	WA2-0646-000	000	B 1	TRANSISTOR 2SD1328	
	WA2-0797-000	000	B 2(3)	TRANSISTOR 2SA1213	
	WA2-0839-000	000	B 1	TRANSISTOR 2SA1226	
	WA2-0884-000	000	B 1	TRANSISTOR DTC144EK	
	WA2-1198-000	000	B 1	TRANSISTOR 1MD2	
	WA2-1228-000	000	B 3	TRANSISTOR 1MT2	
	WA2-1230-000	000	B 1	TRANSISTOR 1MH6-T108	
	WA2-1231-000	000	B 3	TRANSISTOR 1MH8	
	WA2-1232-000	000	B 13(14)	TRANSISTOR 1M21	
	WA2-1233-000	000	B 1	TRANSISTOR 1MX1-T110	E600E ONLY
	WA2-1234-000	000	B 13(14)	TRANSISTOR 1MX2	
	WA2-1235-000	000	B 3	TRANSISTOR 1MB6	
	WA2-1238-000	000	B 1	FET 2SK209	
	WA2-1256-000	000	B 1	TRANSISTOR 1MH5	
	WA2-1337-000	000	B 14(13)	TRANSISTOR 2SC4081	
	WA2-1377-000	000	B 1	TRANSISTOR DTC143EU	
	WA2-1378-000	000	B 9(10)	TRANSISTOR DTC144EU	
	WA2-1400-000	000	B 6(7,12)	TRANSISTOR 2SA1576	
	WA2-1407-000	000	B 1	TRANSISTOR DTC144TU-T106	
	WA2-1437-000	000	B 1	TRANSISTOR 2SB1121	E600E ONLY
	WA2-1498-000	000	B 2	TRANSISTOR 2SA1162	
	WA2-5051-000	000	B 2	TRANSISTOR DTA144EU-T106	
	WA2-5062-000	000	B 2	TRANSISTOR DTC144TU	
	WA2-5088-000	000	B 1	TRANSISTOR DTC144EU	
	WA2-5122-000	000	B 1	TRANSISTOR FC101	
	WA2-5149-000	000	B 1	TRANSISTOR 2SB1412F5	
	WA2-5152-000	000	B 3	TRANSISTOR 2SB1424	
	WA2-5169-000	000	B 1	FET 2SK880	
	WA2-5221-000	000	B 1	TRANSISTOR 2SD1757K	
	WA2-5222-000	000	B 1	FET 2SK1468F	
	WA2-5272-000	000	B 2	TRANSISTOR 1MH14	
	WA2-5283-000	000	B 1	TRANSISTOR DTA144EU-T106	
	WA2-5347-000	000	B 1	TRANSISTOR RN2427	
	WA2-5418-000	000	B 1	TRANSISTOR DTA123EU	
	WA2-5448-000	000	D 1	TRANSISTOR 2SC4132	
	WA3-4264-000	000	B 1	IC SC14966FEL	E600E ONLY
	WA3-5173-000	000	B 3	IC SC7500FEL	
	WA3-5241-000	000	B 2	IC SC7504FEL	
	WA3-5800-000	000	B 2	IC M62352GP-70EC	
	WA3-5853-000	000	B 1	IC MN5151H	E200E,400E ONLY
	WA3-6124-000	000	B 1	IC MN3861SA-E1	E200E,400E ONLY
	WA3-6290-000	000	B 1	IC S-8420DF	
	WA3-6392-000	000	B 1	IC μPD16506GR	
	WA3-6440-000	000	B 1	IC MN3863SA	E600E ONLY
	WA4-0266-000	000	B 1	IC NJM4558M	E600E ONLY
	WA4-0349-000	000	B 1	IC NJM2904M-T1	
	WA4-1145-000	000	B 2	IC RH5VA45AA-T1	
	WA4-5127-000	000	B 1	IC CXA8006M	
	WA4-5144-000	000	B 1	IC CXA1393AN	E400E,600E ONLY
	WA4-5272-000	000	B 1	IC MPC1710BM	
	WA4-5316-000	000	B 1	IC TK11447	E600E ONLY

PARTS LIST

PAGE	PART NO.	CLASS	QTY	DESCRIPTION	REMARKS
	WA4-5365-000 000	B	1	IC LA7456M	E600E ONLY
	WA4-5428-000 000	B	1	IC BA7149F	
	WA4-5435-000 000	B	1(2)	IC LA7454W	
	WA4-5437-000 000	B	4(5)	IC LVC556FA2	
	WA4-5438-000 000	B	1	IC LA8110M	
	WA4-5443-000 000	B	1	IC NJM2246M	
	WA4-5476-000 000	B	1	IC NJM2508M	
	WA4-5485-000 000	B	1	IC CXA1439M	E200E,400E ONLY
	WA4-5507-000 000	B	1	IC NJM4580E	E400E,600E ONLY
	WC3-5044-000 000	B	1	SLIDE SWITCH SSQ-012M	
	WD8-5005-000 000	D	2	LINK, IC D1600	
	WG1-0427-000 000	B	2	LED LT1D51A	
	WK2-0303-000 000	C	1	CRYSTAL OSCILLATOR 8MHz	
	WK2-0508-000 000	C	1	QUARTZ OSCILLATOR CFV-308	
	WK2-0541-000 000	C	1	QUARTZ OSCILLATOR FARC4CB12M	
	WK2-5106-000 000	C	1	QUARTZ OSCILLATOR CM309 5.8MHz	
	WK2-5117-000 000	C	1	QUARTZ OSCILLATOR CM309 8MHz	
	WS1-5170-000 000	C	1	CONNECTOR 4P	E600E ONLY
6	WS6-5001-000 000	C	1	JACK, PIN	E600E ONLY
6	WS6-5029-000 000	C	1	JACK, MIC	
6	XA1-7200-357 000	F	5(6)	SCREW	
2	XA1-7200-359 000	F	2	SCREW	
2	XA1-7200-509 000	F	2	SCREW	
4	XA4-4170-457 000	F	1	SCREW	
2	XA4-8200-509 000	F	4	SCREW	
4	XA4-9170-557 000	F	3	SCREW	
4	XA4-9170-607 000	F	1	SCREW	
2,6	XA4-9200-409 000	F	2	SCREW	
4	XA4-9200-457 000	F	1	SCREW	
2,4	XA4-9200-459 000	F	16	SCREW	
2,4	XA4-9200-509 000	F	7	SCREW	
2	XA4-9200-609 000	F	5	SCREW	
4	XA4-9201-209 000	F	2	SCREW	
2	XA9-0521-000 000	F	3	SCREW	
2	XA9-0560-000 000	F	1	SCREW	
4	XA9-0611-000 000	F	2	SCREW	E200E,400E ONLY
4	XB4-7260-507 000	F	1	SCREW	E600E ONLY
4	YA1-0661-000 000	F	1	SCREW	E200E ONLY
4	YG9-5095-000 000	C	1	RELAY LENS ASS'Y	
4	YG9-5119-000 000	C	1	SWITCH, INFINITY	
4	YG9-5234-000 000	C	1	AF SUB P.C.B. ASS'Y	E200E,400E ONLY
4	YG9-5239-000 000	C	1	RELAY LENS ASS'Y	E400E ONLY
4	YG9-5240-000 000	C	1	RELAY HOLDER ASS'Y	E200E,400E ONLY
4	YG9-5248-000 000	C	1	RELAY LENS ASS'Y	E600E ONLY
4	YG9-5292-000 000	C	1	AF SUB P.C.B. ASS'Y	E600E ONLY
4	YH7-0027-000 000	C	1	AF MOTOR	
4	YH7-0059-000 000	C	1	P2 MOTOR	
4	YH8-0033-000 000	C	1	1G METER	E200E,400E ONLY
4	YN1-0235-000 000	C	1	LOW PASS FILTER	E200E ONLY
	Y22-2873-000 000	B	1	IC MC68HC11A8	
	Y22-2874-000 000	B	1	IC MC68HC11A8	E400E ONLY
	Y22-2875-000 000	B	1	IC MC68HC11A8	E600E ONLY

CONTENTS

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2. Block Diagrams	IV-2
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2-2 VS P.C.B. (SYSCON-SERVO SECTION)	IV-4
2-3 AUDIO P.C.B. (E200E, E400E) & VS P.C.B. (VIDEO SECTION)	IV-5
2-4 AUDIO P.C.B. (E600E) & VS P.C.B. (VIDEO SECTION)	IV-5
3. Circuit Board/Schematic Diagrams	IV-6, 7
3-1 SP P.C.B. (E200E)	IV-8, 9
3-2 SP P.C.B. (E400E, E600E)	IV-10, 11
3-3 VS P.C.B. (SYSCON-SERVO SECTION)	IV-12, 13
3-4 VS P.C.B. (VIDEO SECTION)	IV-14, 15
3-5 AUDIO P.C.B. (E200E, E400E)	IV-16, 17
3-6 AUDIO P.C.B. (E600E)	IV-18, 19
3-7 GRIP P.C.B.	

<Guide to diagrams>

1. Color coding

(1) Single lines in block diagrams

Camera section	
Red (——)	: Y
(----)	: C
AUTO-FOCUS section	
Red (——)	: ES/CU

Syscon-servo section

Red (——)	: Drum servo signal
(----)	: Capstan servo signal

Video section

Red (——)	: Recording
(----)	: Playback

(2) Voltage on circuit diagram

Red	: Recording
Black	: Playback

(3) Signal lines in circuit diagrams

Camera section	
Red	: Power supply line
Blue	: Luminance signal
Orange	: Chrominance signal
Hatched black ()	: Luminance + Chrominance signals

Recorder section	
Blue (——)	: Capstan PWM signal
(----)	: Capstan ATF signal
(----)	: Capstan FG signal
Orange (——)	: Drum PWM signal
(----)	: Drum FG signal
(——)	: Drum PG signal

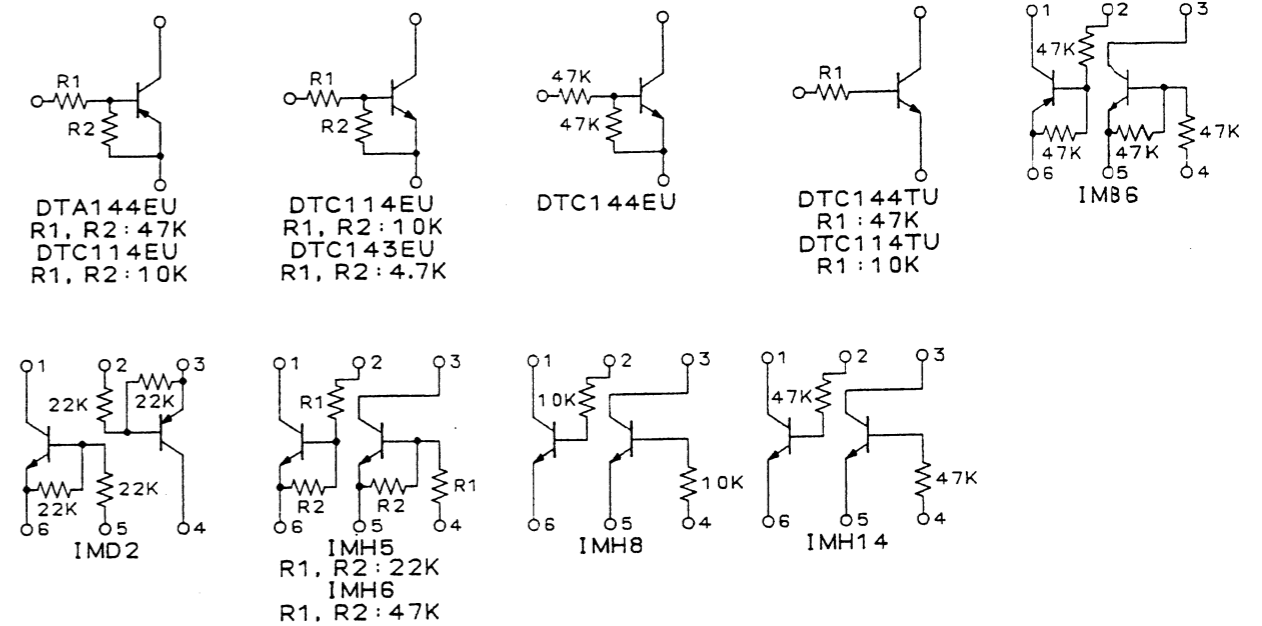
Recorder section

Gray (——)	: Recording luminance + Chrominance signals
(----)	: Playback luminance + Chrominance signals
Blue (——)	: Recording luminance signal
(----)	: Playback luminance signal
(——)	: Playback capstan ATF signal
Orange (——)	: Recording chrominance signal
(----)	: Playback chrominance signal
Red (——)	: Recording audio signal
(----)	: Playback audio signal

(4) PC board layout

Orange	: Component-side pattern
Hatched black ()	: Soldered-side pattern
Black	: Parts on component-side
Blue	: Parts on soldered-side

2. Equivalent circuits of digital transistors



3. Indications in circuit diagram

- Resistance is represented in ohms (Ω).
- Capacitance is represented in farads (F).
- Wattage of resistor is 1/16 W unless otherwise specified.
- Withstand voltage of capacitor is 25 V unless otherwise specified.
- Voltages are measured with a digital voltmeter.
- Waveform photographs are taken by using a 10:1 probe.
- IC Nos. in P.C.B.s are listed on the bottom of diagrams.
- Nos. colored in blue correspond to the Nos. of waveform photographs.
- Voltage values and waveform photographs in circuit diagram are based on the following condition.

Camera section conditions

Color bar, standard angle of view

Recorder section conditions

Recording : Color bar (pattern generator)
Playback : Self-recording playback (color bar)

INTERCONNECTION DIAGRAM

VS P.C.B.	
CN100	1 UNREG 5V
2 GND	
CN101	1 TAPE SENS. LED
2 SS 5V	
3 BOT SENS.	
4 EOT SENS.	
5 T-REEL SENS (-)	
6 T-REEL SENS (+)	
7 S-REEL SENS (-)	
8 S-REEL SENS (+)	
9 MP / ME	
10 REC PROOF	
11 GND	
12 MODE SW 3	
13 MODE SW 2	
14 MODE SW 1	
15 DEW	
16 CASSETTE IN	
CN102	1 LOAD
2 LOAD	
3 UNLOAD	
4 UNLOAD	
CN104	1 D-PG
2 COM	
3 D-FG	
4 DRUM COM	
5 W	
6 V	
7 V	
CN105	1 EVF VIDEO
2 GND	
3 HD	
4 VD	
5 TELE SW	
6 WIDE SW	
7 TRIG SW	
8 EVF ON	
9 LIGHT ON	
10 LITHIUM 3V	
11 GND	
CN106	1 GND
2 CAPSTAN-VS	
3 UNREG 5V	
4 CAPSTAN ON	
5 CAPSTAN FWD	
6 C-FG	
CN107	1 NC
2 NC	
3 POWER LED	
4 EVER 5V DET.	
5 EJECT SW	
6 POWER SW	
7 KEY 1	
8 GND	
CN108	1 CAMERA (Y)
2 GND	
3 CAMERA (C)	
4 GND	
5 BACK UP	
6 GND	
7 CAMERA ON	
8 CAMERA-CS	
9 CAMERA REQ.	
10 CAMERA CLOCK	
11 C-DATA IN	
12 C-DATA OUT	
CN109	1 VIDEO OUT
2 GND	
3 CAMERA (Y)	
4 CAMERA (C)	
5 TRIG SW	
6 TRIG SW	
7 HEAD SW PULSE	
8 PB-RF	
9 SHIFT	
10 GND	
11 EJECT SW	
12 POWER SW	
13 KEY 1	
14 SS 5V	

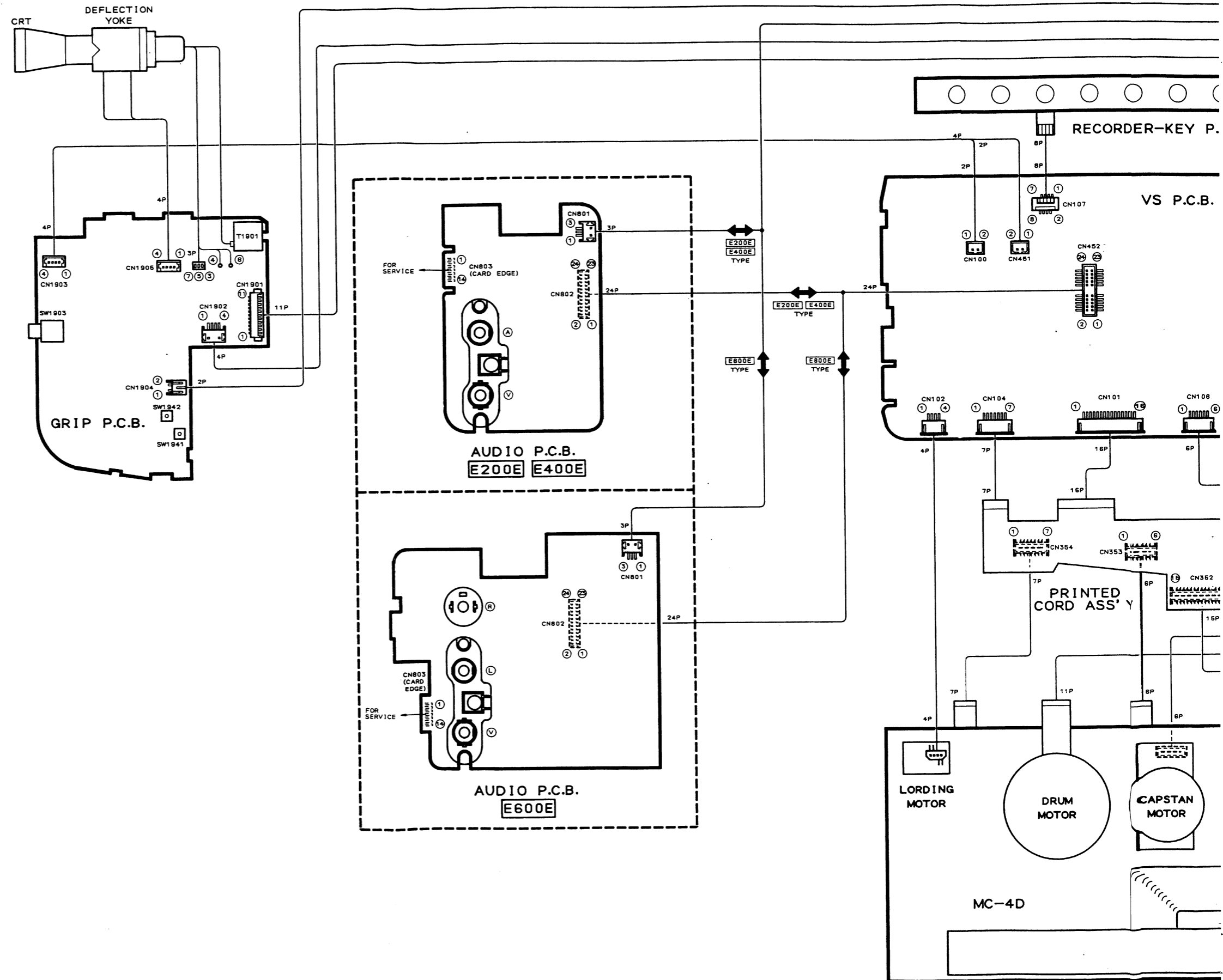
VS P.C.B.	
CN110	1 GND
2 SS 5V	
3 REMOCON	
4 TALLY	
5 KEY 3	
6 KEY 2	
7 NC	
8 NC	
CN401	1 CH-1
2 VIDEO 5V	
3 GND	
4 VIDEO 5V	
5 CH-2	
6 GND	
7 GND	
8 GND	
9 GND	
10 GND	
11 FE HEAD	
CN451	1 UNREG 5V
2 GND	
CN452	1 PB-RF
2 A-FADE	
3 GND	
4 A-MUTE	
5 REC AUDIO	
6 SP/LP SW	
7 GND	
8 SP /LP	
9 GND	
10 CAMERA	
11 NC	
12 NC	
13 NC	
14 NC	
15 UNREG 5V	
16 HEAD SW PULSE	
17 UNREG 5V	
18 PB /EE	
19 VIDEO OUT	
20 AV ON	
21 GND	
22 GND	
23 SC	
24 VIDEO 5V	

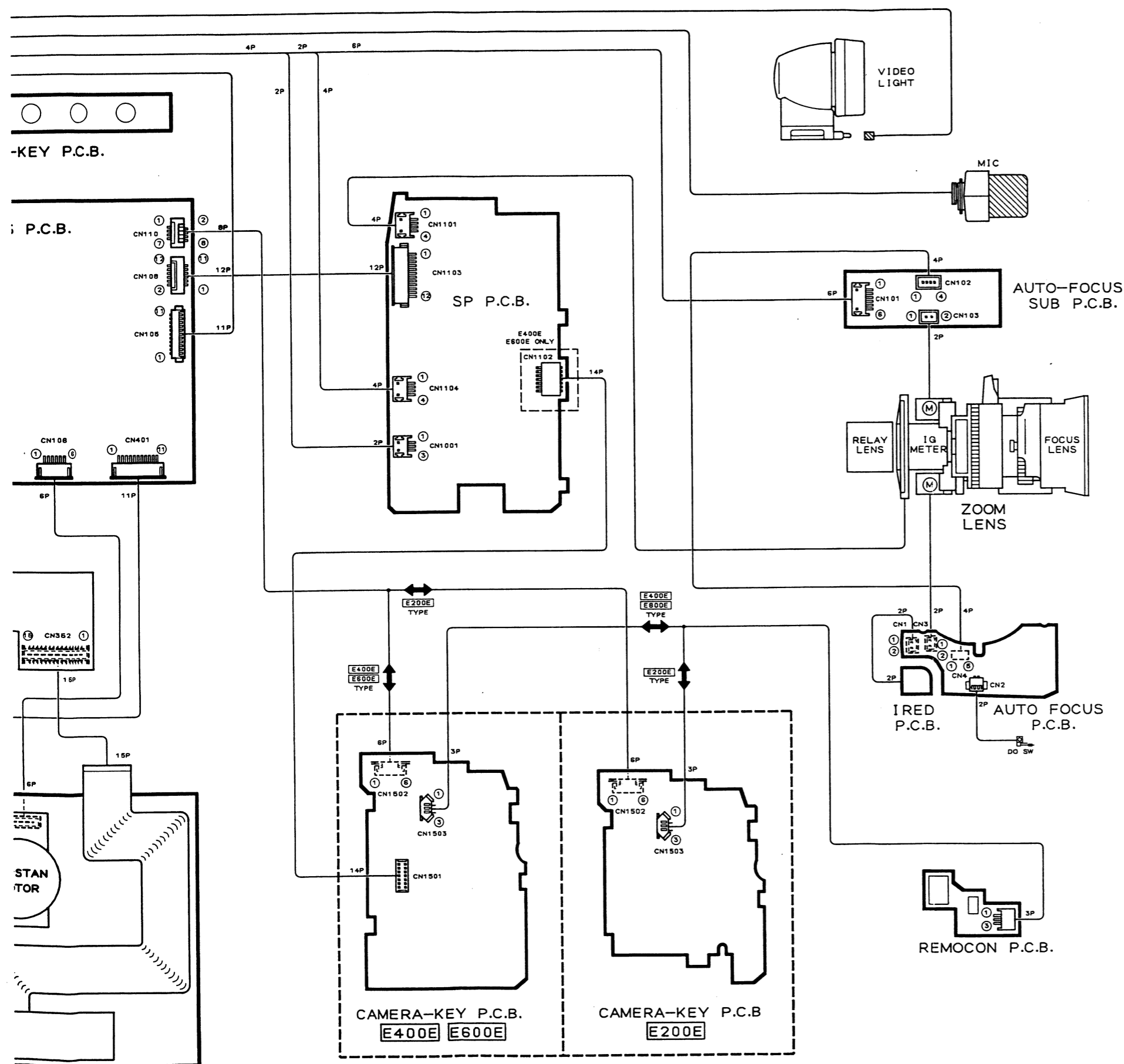
GRIP P.C.B.	
CN1901	
1	EVF VIDEO
2	GND
3	HD
4	VD
5	TELE SW (L)
6	WIDE SW (L)
7	TRIG. SW (L)
8	EVF ON (L)
9	LIGHT ON (L)
10	LITHIUM 3V
11	GND
CN1902	
1	UNREG 5V
2	GND
3	UNREG 5V
4	GND
CN1903	
1	UNREG 5V
2	GND
3	UNREG 5V
4	GND
CN1904	
1	LIGHT (+)
2	LIGHT (-)
CN1905	
1	H+
2	H-
3	V+
4	V-
CN1901	
1	H.V
2	K
4	G3
5	G1
6	G2
7	H

RECORDER-KEY P.C.B.	
CN300	1 NC
2 NC	
3 POWER LED	
4 EVER 5V DET.	
5 EJECT SW	
6 POWER SW	
7 KEY 1	
8 GND	

AUDIO P.C.B. (E200E, E400E ONLY)	
CN801	1 GND
2 MIC IN	
3 GND	
CN802	1 PB-RF
2 A-FADE	
3 REC AUDIO	
4 A-MUTE	
5 REC AUDIO	
6 SP/LP SW	
7 GND	
8 SP /LP	
9 GND	
10 CAMERA	
11 NC	
12 NC	
13 NC	
14 NC	
15 UNREG 5V	
16 HEAD SW PULSE	
17 UNREG 5V	
18 PB /EE	
19 VIDEO OUT	
20 AV ON	
21 GND	
22 GND	
23 SC	
24 VIDEO 5V	
CN803 (CARD EDGE)	1 NC
2 NC	
3 NC	
4 SP/LP SW	
5 SP/LP SW	
6 NC	
7 NC	
8 NC	
9 NC	
10 GND	
11 GND	
12 NC	
13 AUDIO OUT	
14 AUDIO OUT	

AUDIO P.C.B. (E600E ONLY)	
CN801	1 GND
2 MIC IN (L)	
3 MIC IN (R)	
CN802	1 PB-RF
2 A-FADE	
3 GND	
4 A-MUTE	
5 REC AUDIO	
6 SP/LP SW	
7 GND	
8 SP /LP	
9 GND	
10 CAMERA	
11 NC	
12 NC	
13 NC	
14 NC	
15 UNREG 5V	
16 HEAD SW PULSE	
17 UNREG 5V	
18 PB /EE	
19 VIDEO OUT	
20 AV ON	
21 GND	
22 GND	
23 SC	
24 VIDEO 5V	
CN803 (CARD EDGE)	1 NC
2 NC	
3 NC	
4 SP/LP SW	
5 SP/LP SW	
6 NC	
7 I/O	
8 I/O	
9 NC	
10 GND	
11 GND	
12 NC	
13 (MONORAL) OUT	
14 (MONORAL) OUT	





SP P.C.B.
CN1001
1 UNREG 5V
2 GND
3 CAMERA ON
CN1101
1 D+
2 C+
3 GND
4 C-
CN1102 (E200E, E600E ONLY)
1 HD
2 GND
3 Y BLK
4 C BLK
5 TITLE YB
6 BACK UP
7 TITLE YR
8 TITLE YG
9 RESET
10 Y A/D
11 VD
12 DM-CS
13 C-CLOCK
14 C-DATA
CN1103
1 C-DATA
2 C-DATA
3 C-CLOCK
4 CAMERA REQ.
5 CAMERA-CS
6 CAMERA ON
7 GND
8 BACK UP
9 GND
10 CAMERA (C)
11 GND
12 CAMERA (Y)
CN1104
1 AF CONT.
2 WIDE
3 TELE
4 GND

REMOCON P.C.B.
CN1601
1 REMOTE
2 SS 5V
3 GND

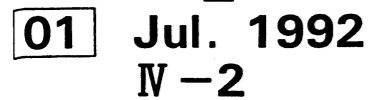
CAMERA-KEY P.C.B.
CN1501 (E400E, E600E ONLY)
1 HD
2 GND
3 Y BLK
4 C BLK
5 TITLE YB
6 BACK UP
7 TITLE YR
8 TITLE YG
9 RESET
10 Y A/D
11 VD
12 DM-CS
13 C-CLOCK
14 C-DATA
CN1502
1 GND
2 SS 5V
3 REMOTE
4 TALLY
5 KEY 3
6 KEY 2
CN1503
1 REMOTE
2 SS 5V
3 GND

AUTO FOCUS P.C.B.
CN1
1 NEAR
2 FAR
CN2
1 INFINITE SW
2 GND
CN3
1 IRED (-)
2 IRED (+)

AUTO FOCUS SUB P.C.B.
CN101
1 UNREG 5V
2 GND
3 AF CONT.
4 WIDE
5 TELE
6 GND
CN102
1 AF CONT.
2 GND
3 UNREG 5V
4 VIR
CN103
1 TELE
2 WIDE

1 2 3 4 5 6 7 8

o SIGNAL PATH - - - - Y+C SIGNAL Y SIGNAL - . . . C SIGNAL



9

10

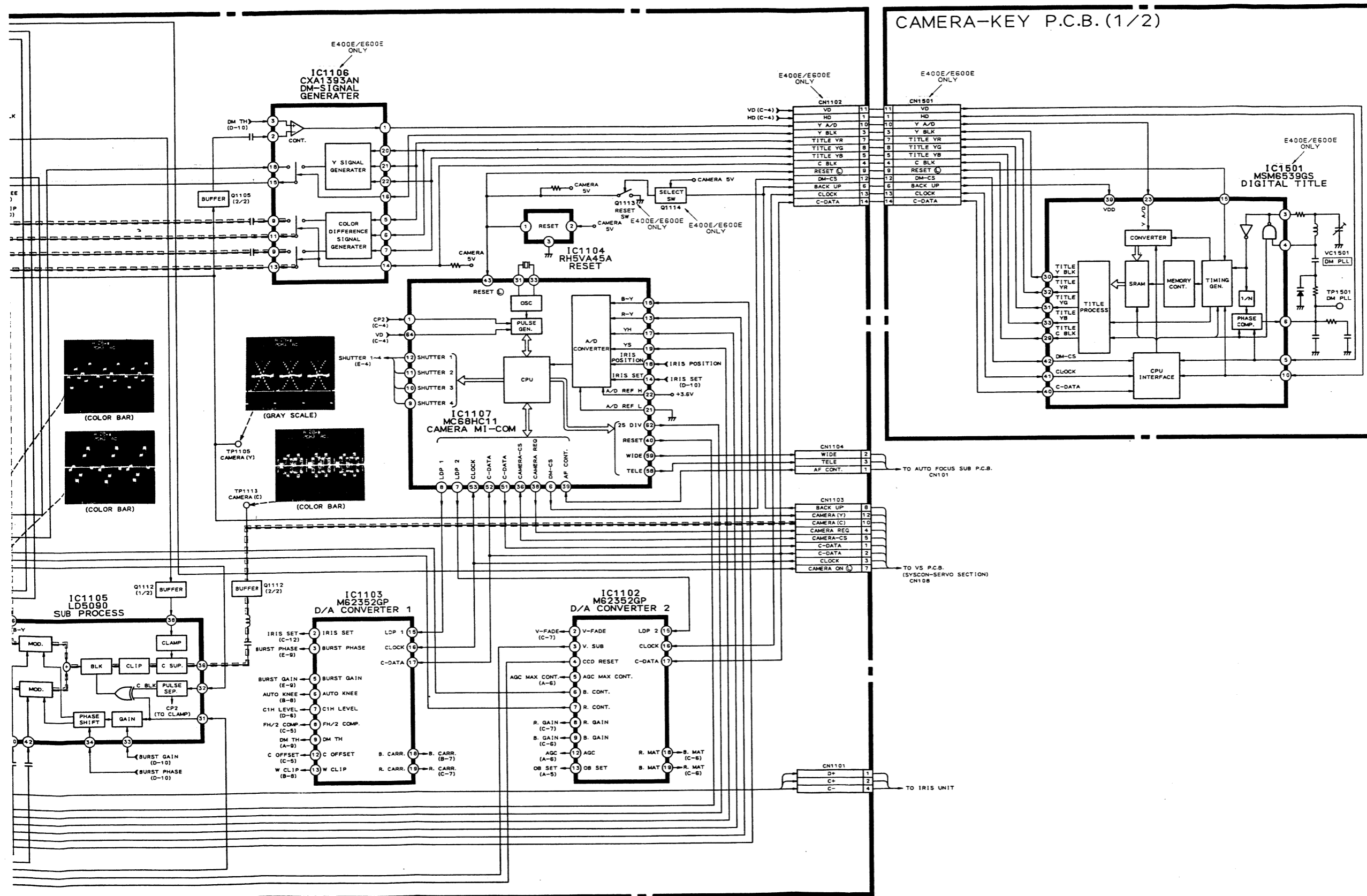
11

12

13

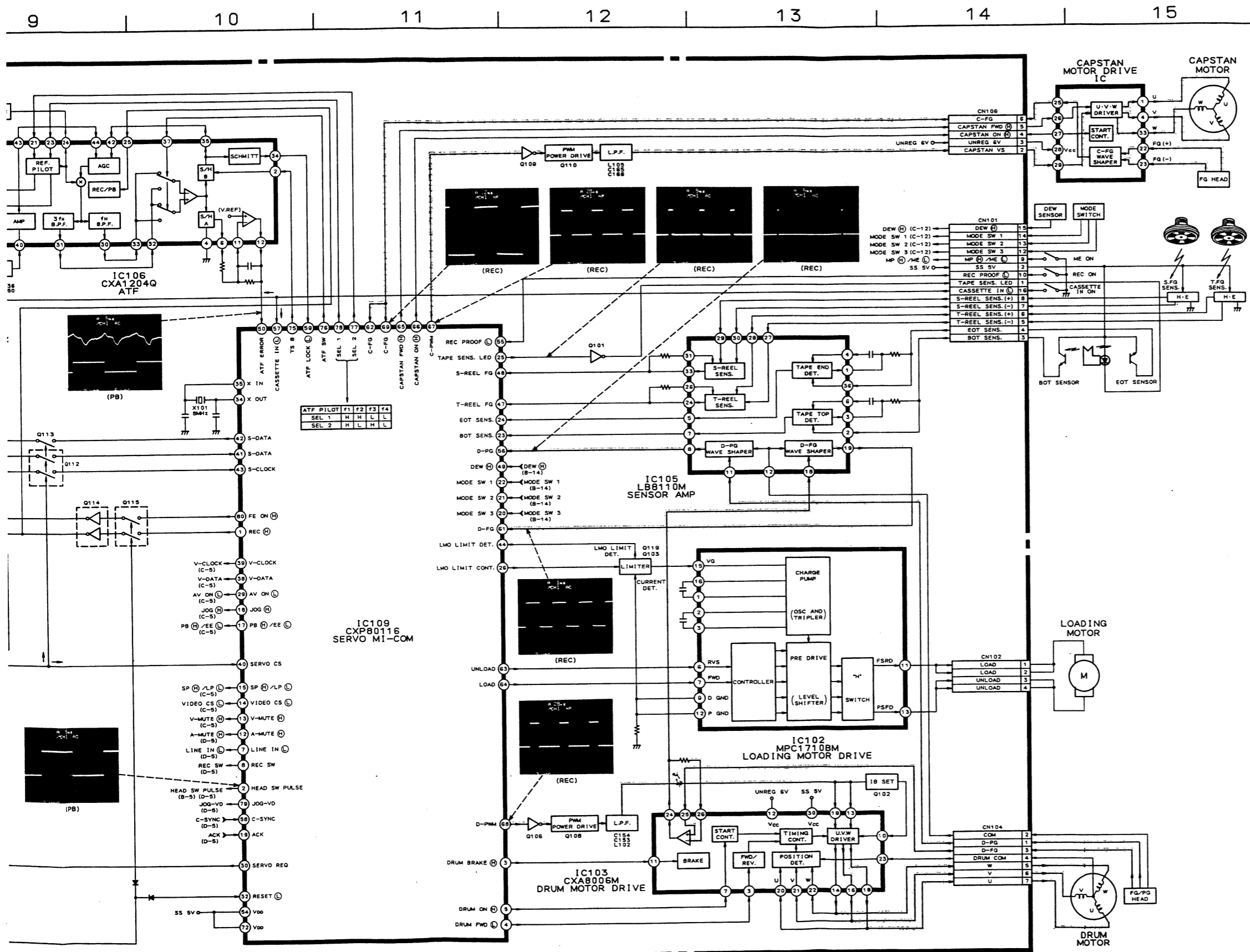
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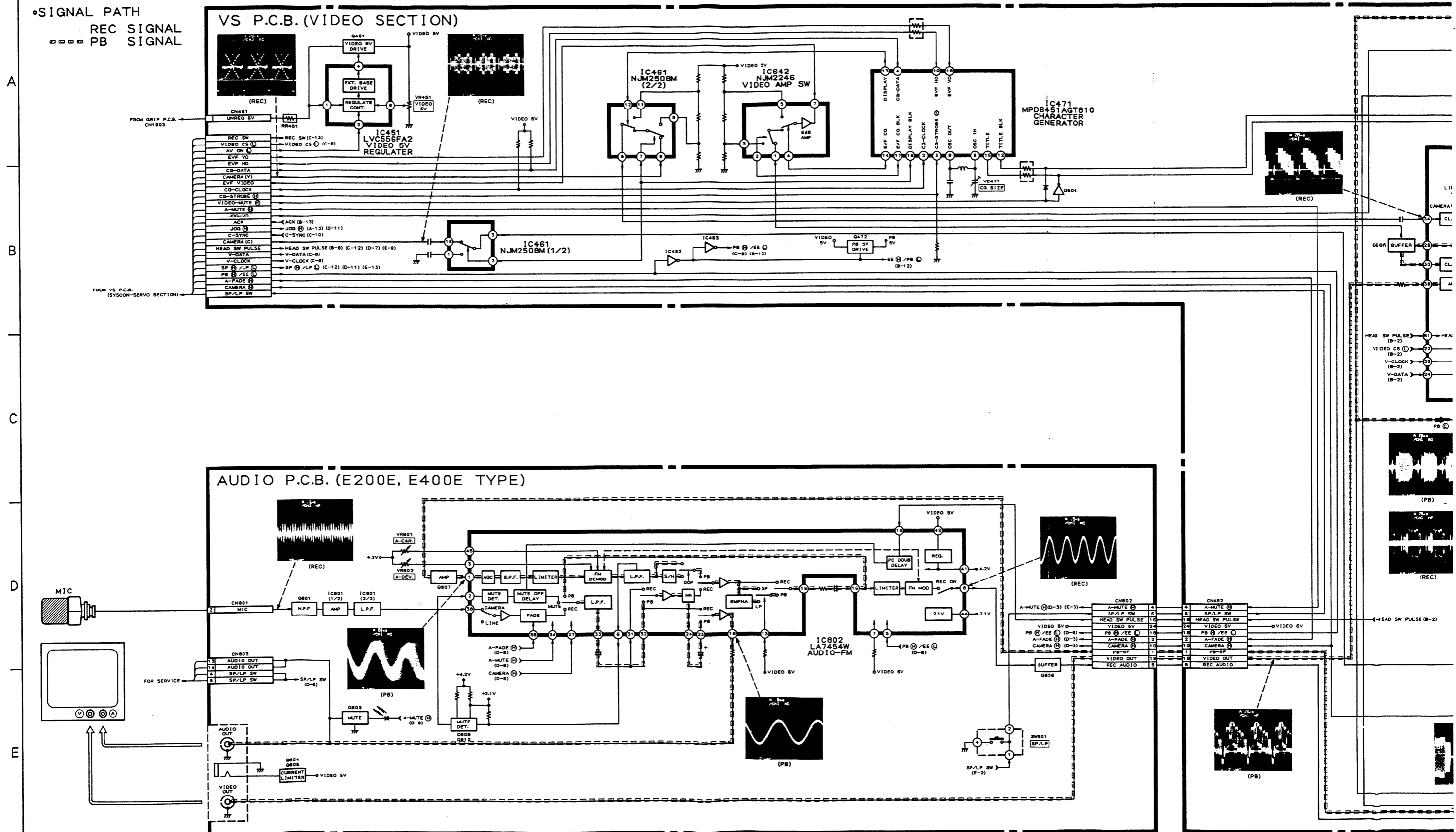
15

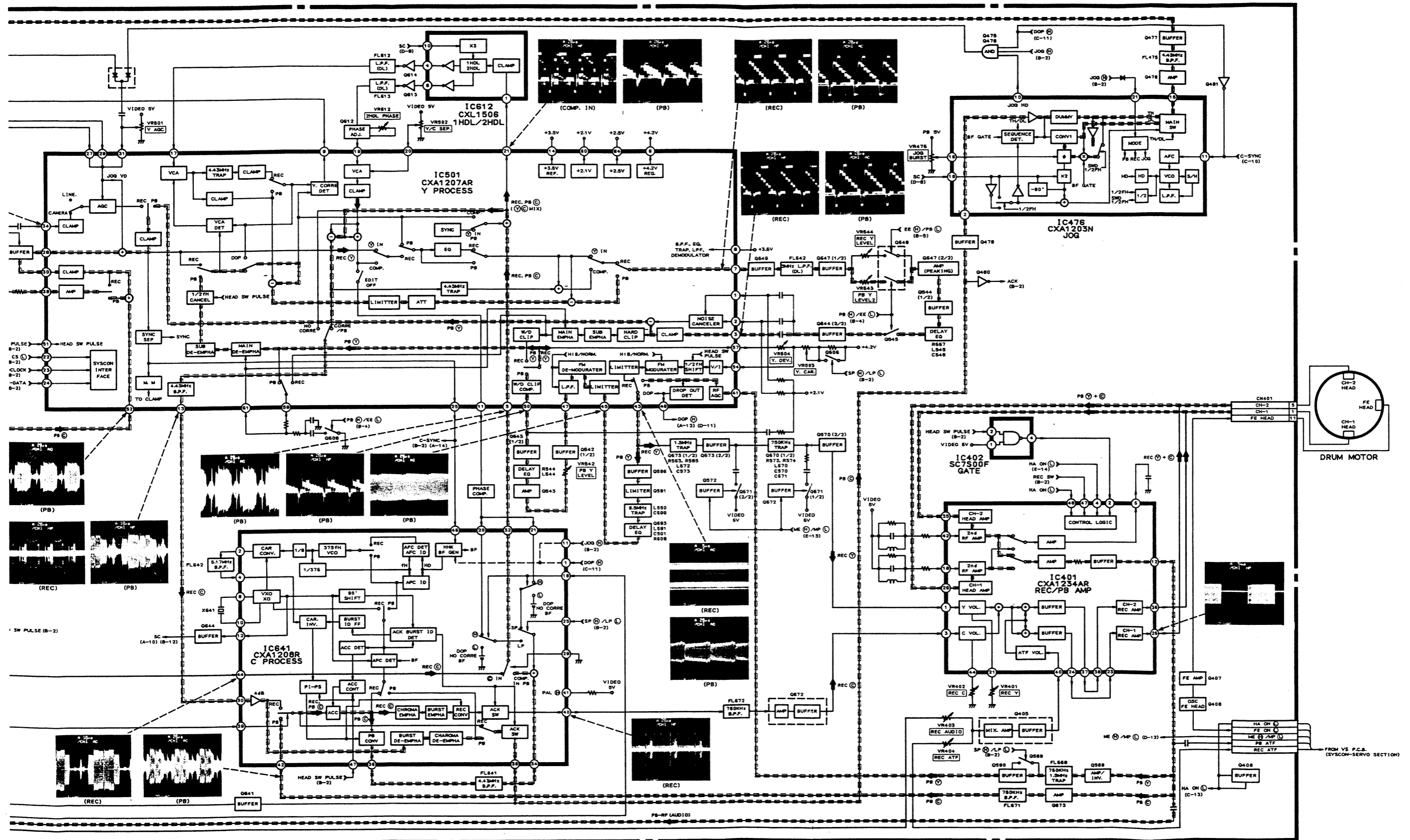


A horizontal number line with tick marks at each integer from 1 to 9. The numbers are written below the line.



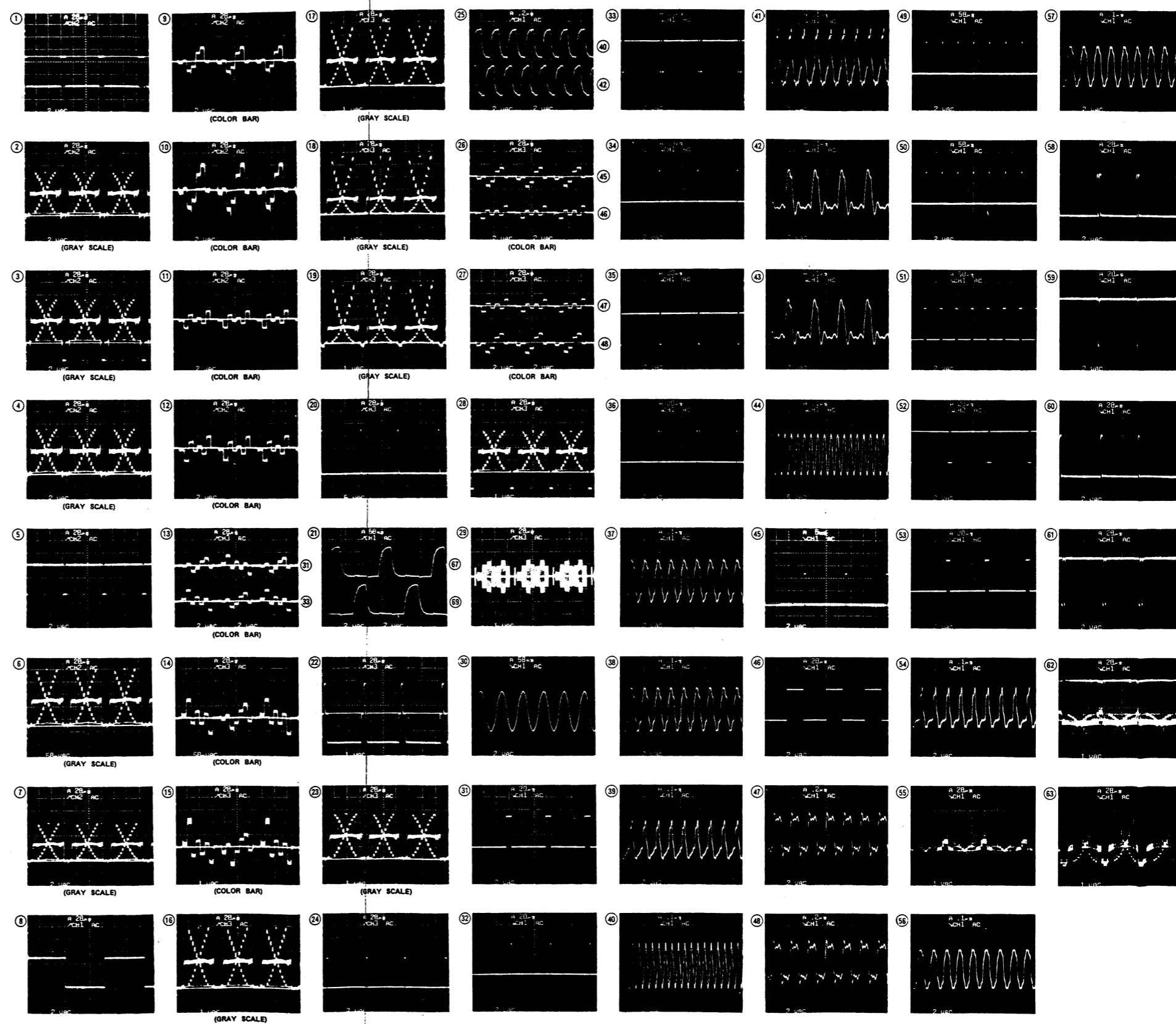






[illegible]

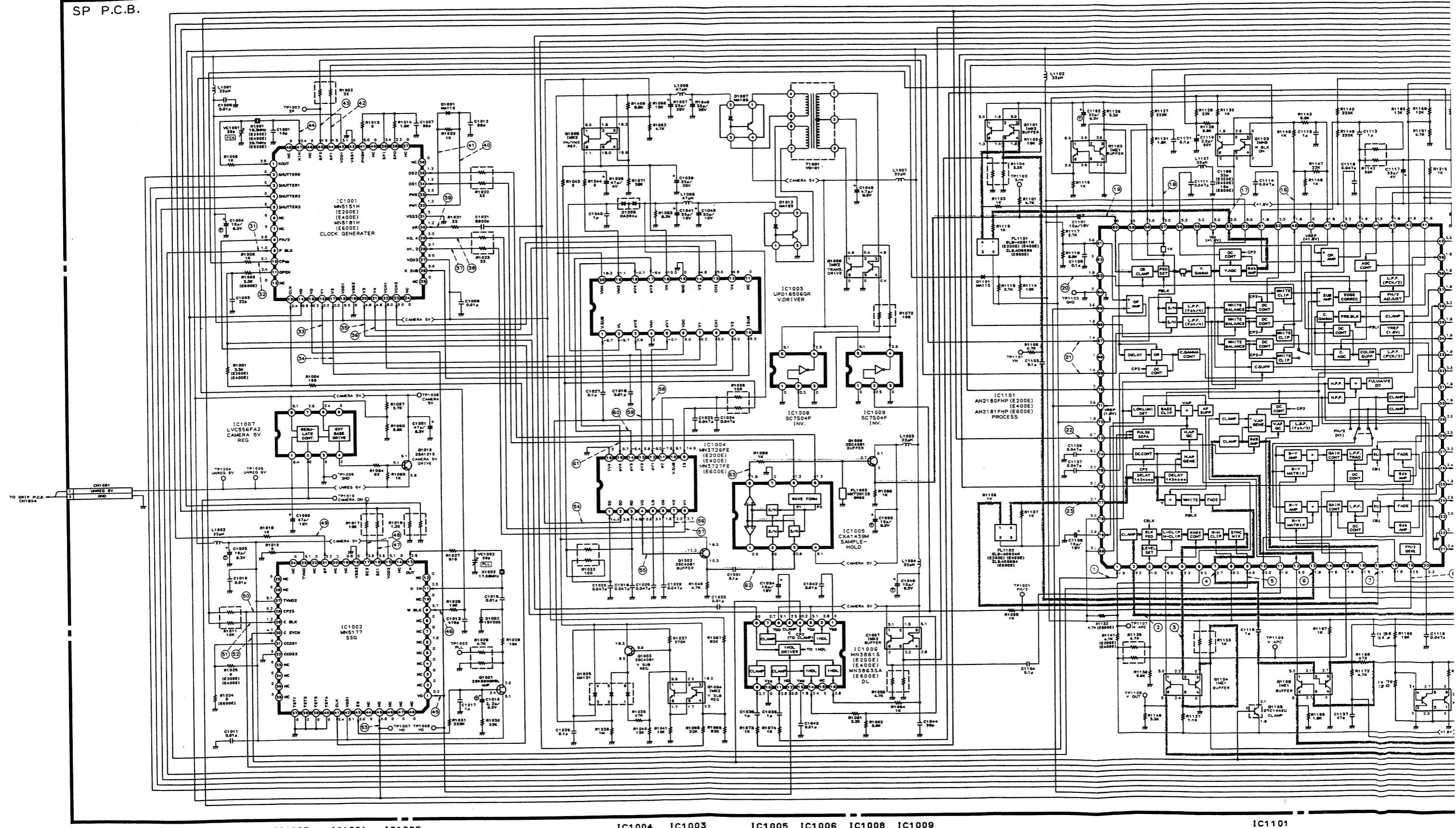
SIGNAL WAVEFORMS



SCHEMATIC DIAGRAM SP P.C.B. (E200E,E400E,E600E)

• SIGNAL PATH — Y+C SIGNAL (GRAY) — Y SIGNAL

SP P.C.B.



IC1007 IC1001 IC1002

IC1004 IC1003 IC1005 IC1006 IC1008 IC1009

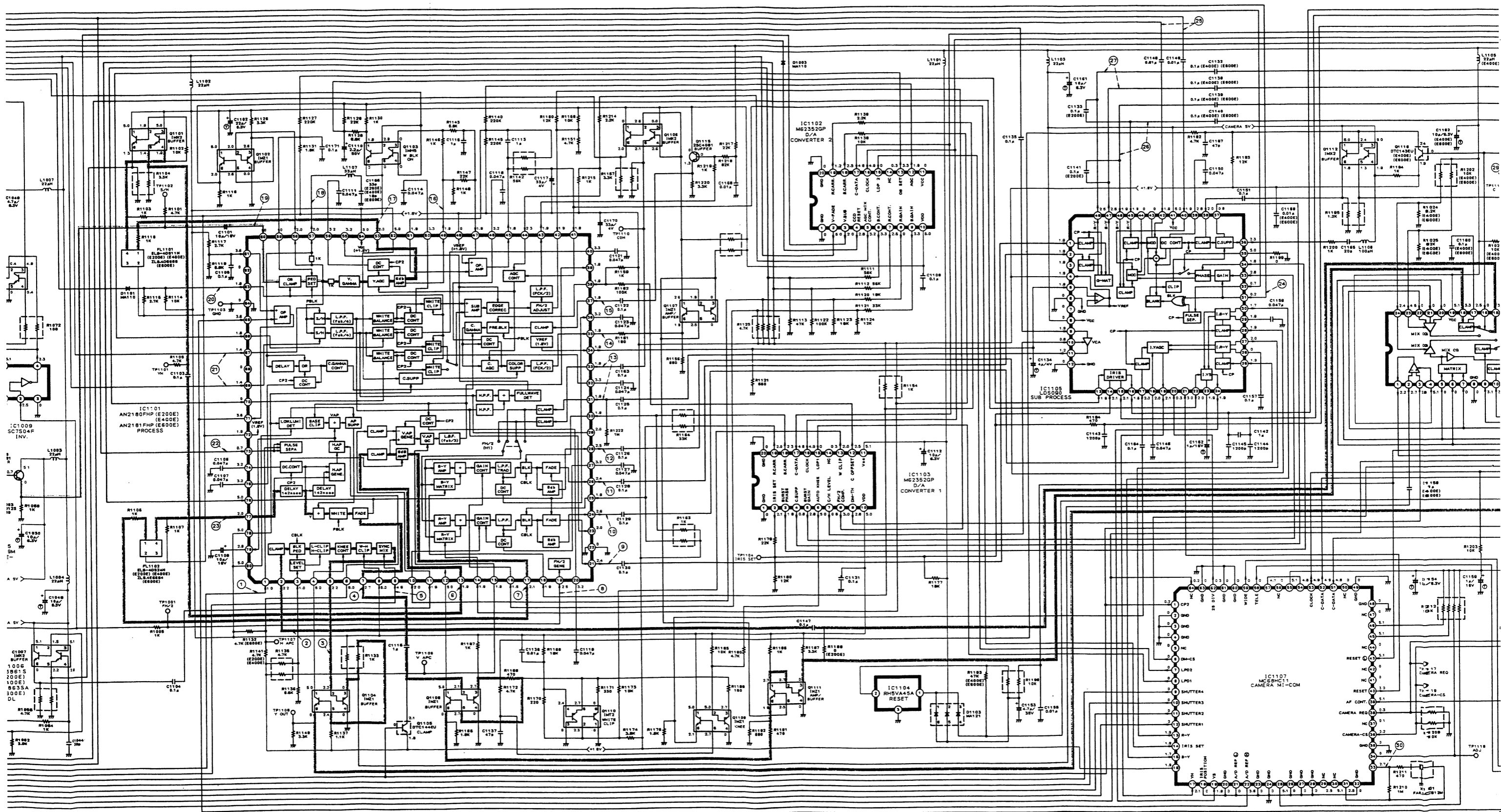
IC1101

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~~SECRET~~ Y+C SIGNAL (GRAY)

— Y SIGNAL (BLUE)

C SIGNAL (ORANGE)



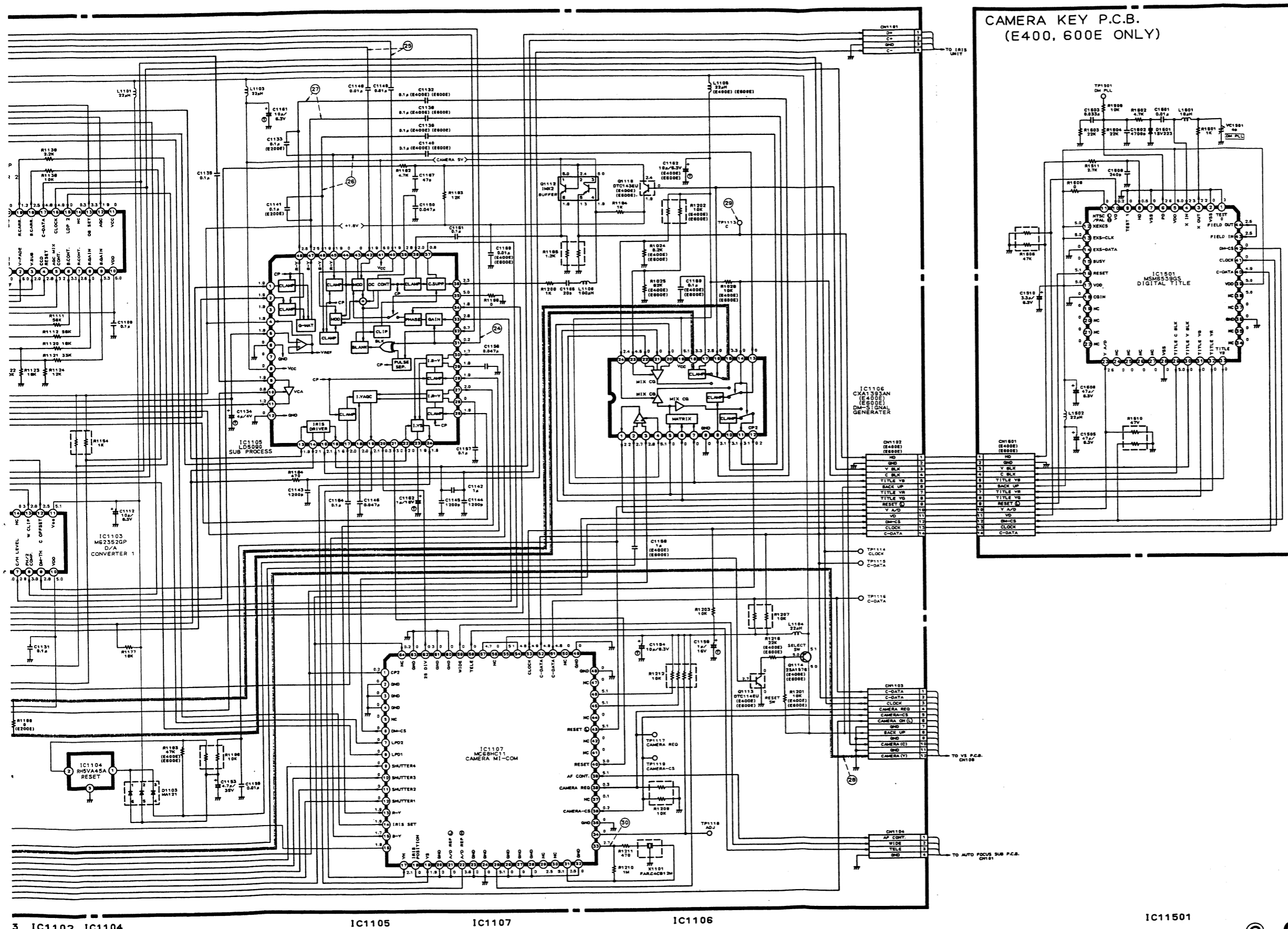
IC1101

IC1103 IC1102 IC1104

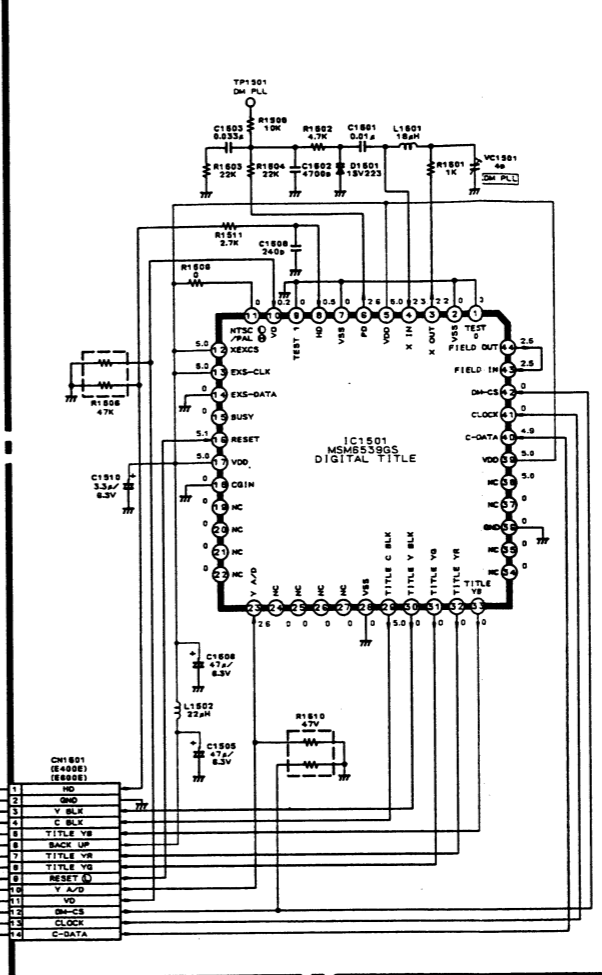
IC1105

IC1107

IC1106



CAMERA KEY P.C.B.
(E400, 600E ONLY)



3 IC1102 IC1104

IC1105

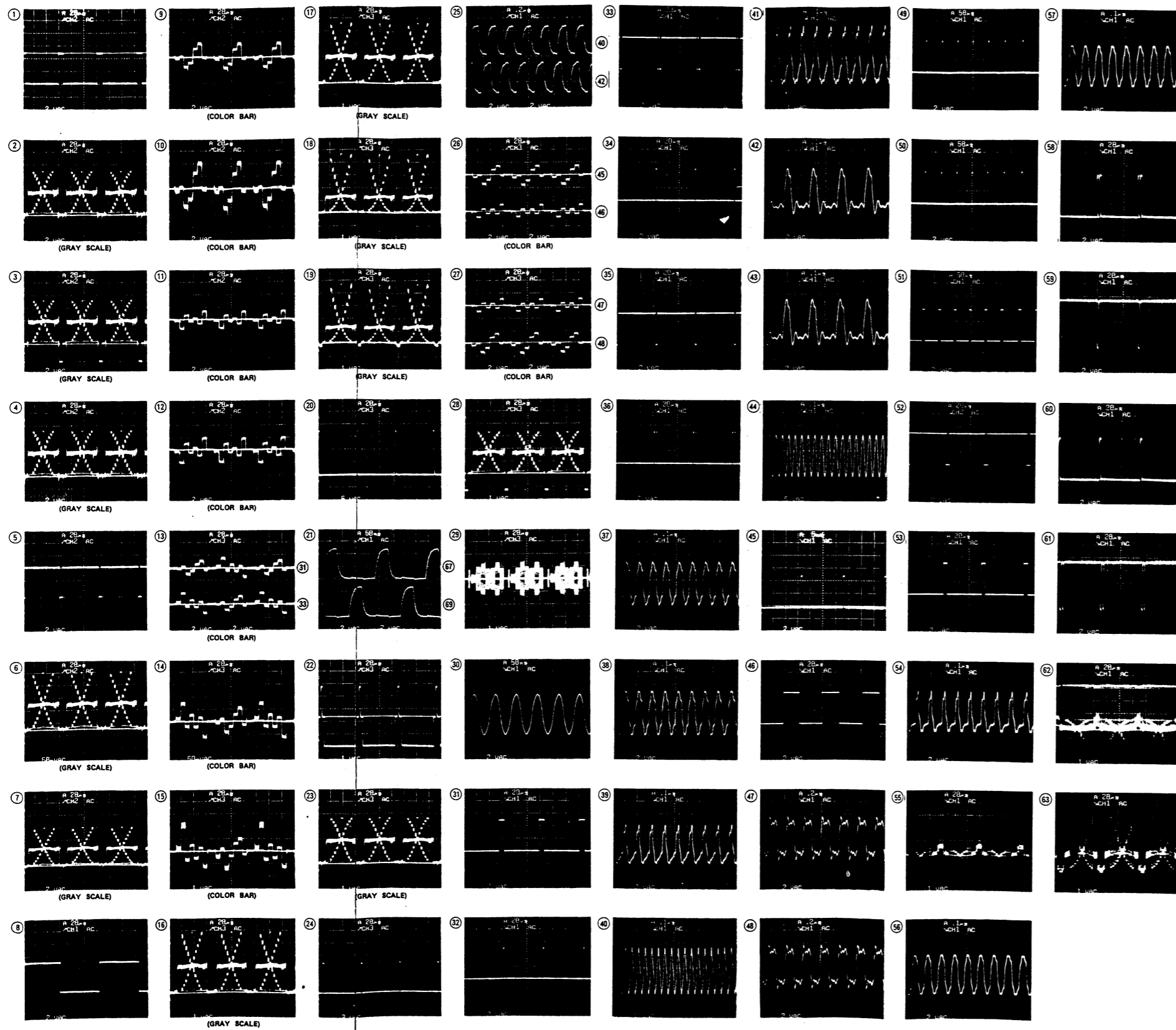
IC1107

IC1106

IC11501

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SIGNAL WAVEFORMS



CIRCUIT BOARD DIAGRAM SP P.C.B. (E400E,E600E)

SP P.C.B. (COMPONENT SIDE)

< NOTICE >

SP P.C.B. consists of four layers.
(Soldering, Component, Power Supply and Ground patterns.)

※ Through-hole marks on each P.C.B. denote :

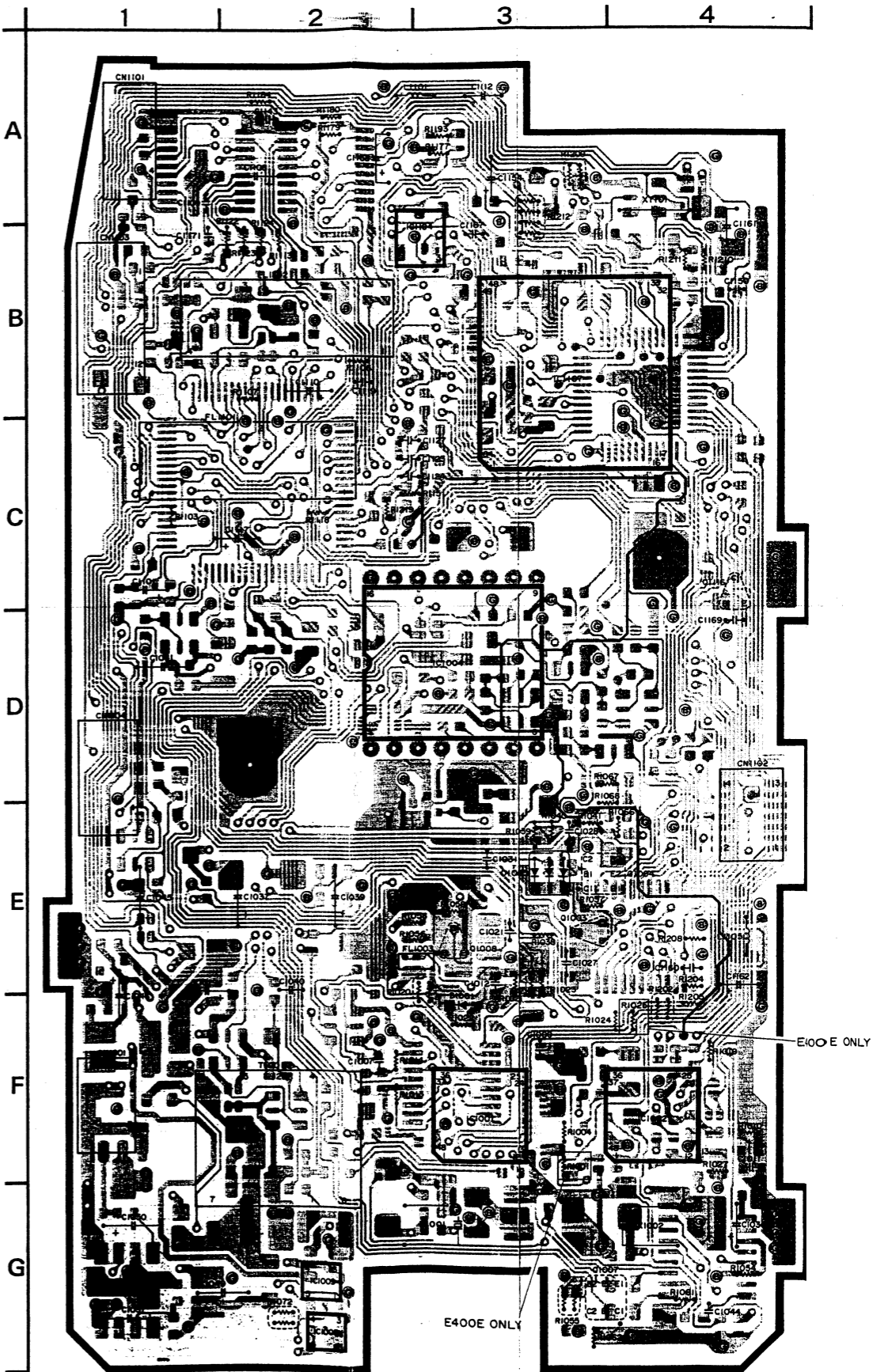
- : Soldering side ↔ Component side
- ⊙ : Soldering side (Component side) ↔ Ground
- ⊕ : Soldering side (Component side) ↔ Power Supply

And, blue lines denote signal patterns which connected in the
Ground or Power Supply layer.

Blue (——) : Power Supply layer

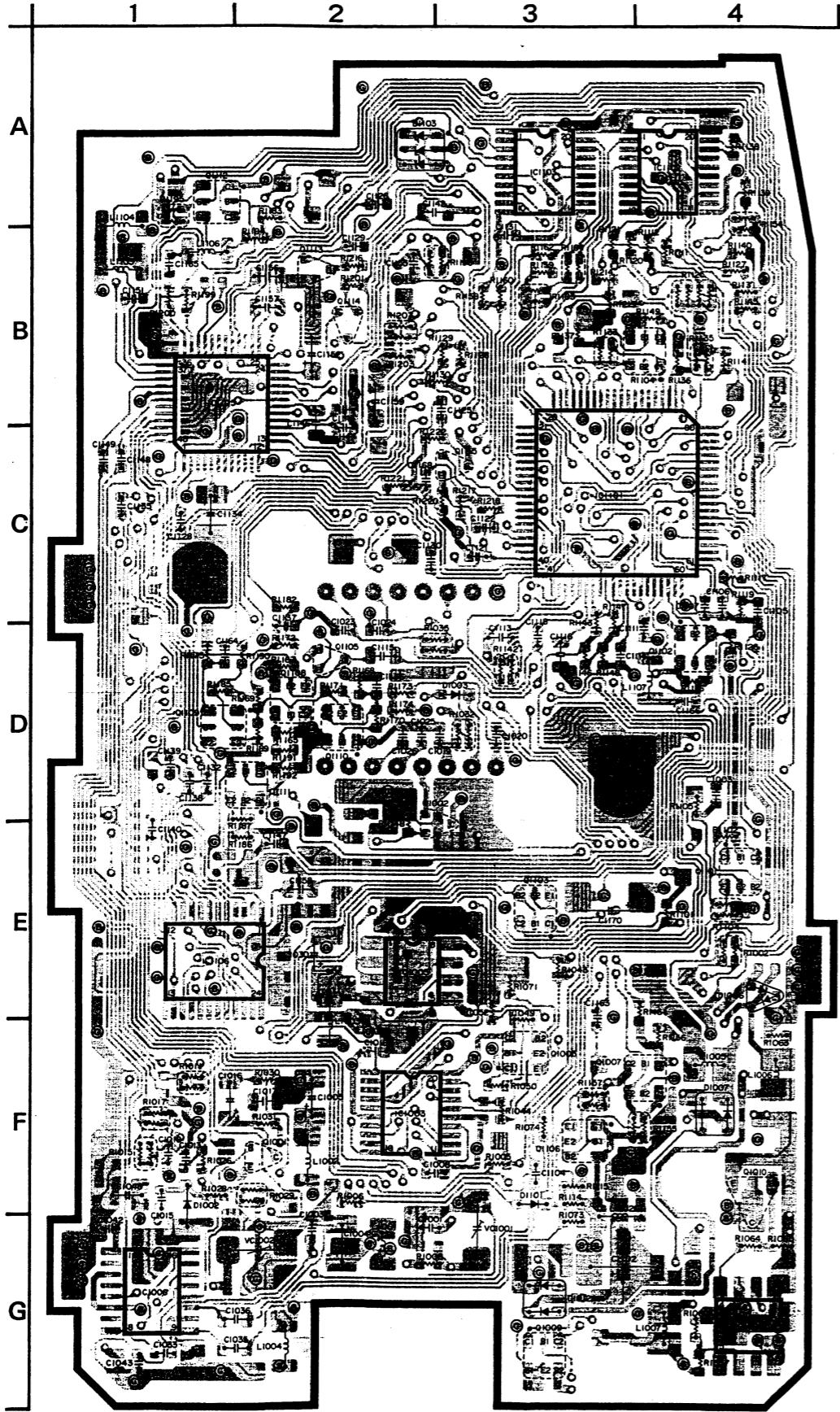
Blue (----) : Ground layer

D1001	F-3
D1005	E-3
IC1001	F-3
IC1002	F-4
IC1004	B-3
IC1008	G-2
IC1009	G-2
IC1104	D-3
IC1107	B-3
Q1003	E-3
Q1004	E-3
Q1007	G-3
Q1008	E-3
Q1116	D-4



SP P.C.B. (SOLDERING SIDE)

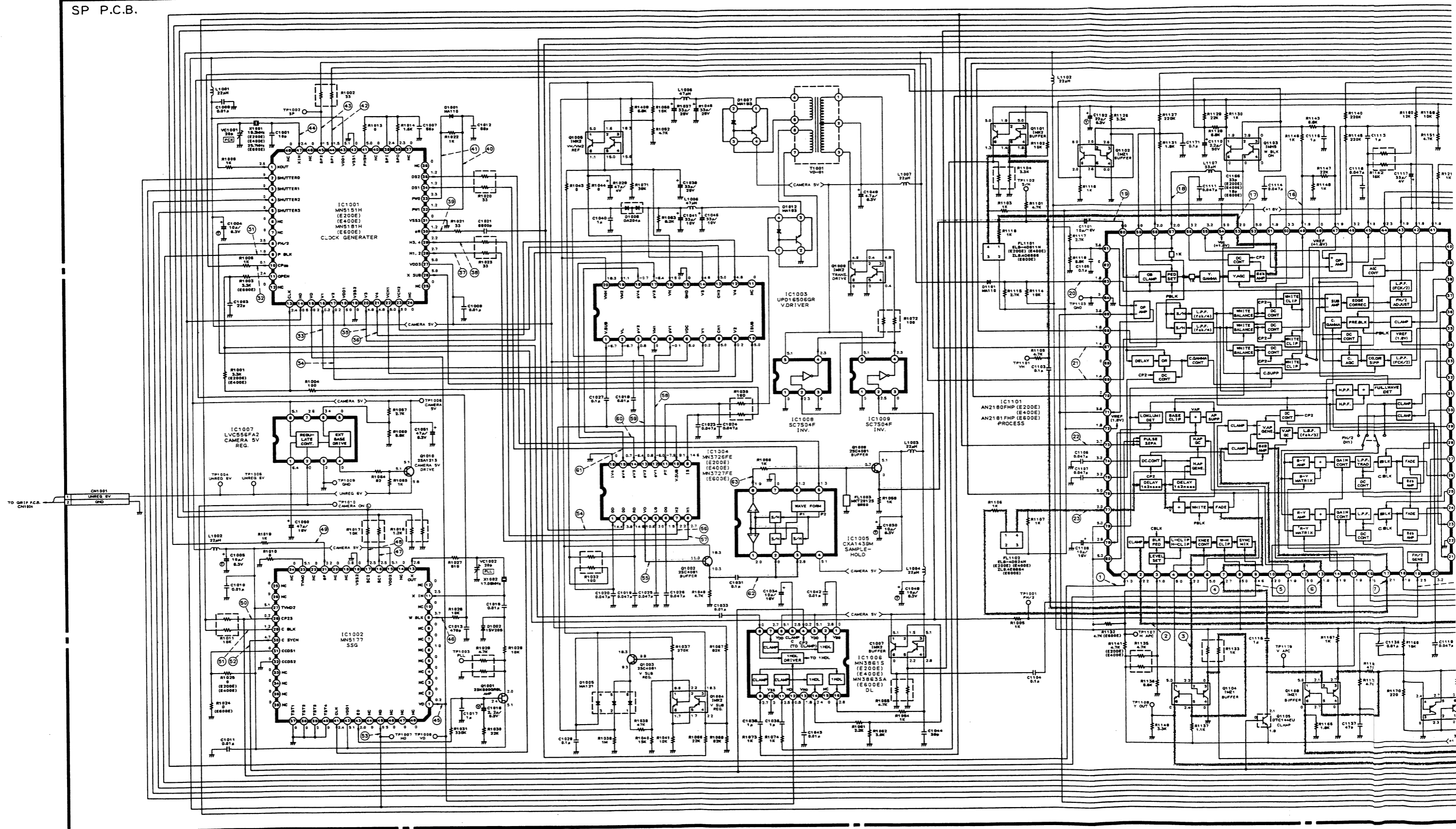
D1002	F-1
D1003	D-3
D1006	E-4
D1007	F-4
D1012	G-3
D1101	F-3
D1103	A-2
IC1003	F-2
IC1005	E-2
IC1006	G-2
IC1007	G-4
IC1101	C-3
IC1102	A-4
IC1103	A-3
IC1105	B-1
IC1106	E-1
Q1001	F-2
Q1002	D-3
Q1005	F-3
Q1007	F-4
Q1009	D-1
Q1010	F-4
Q1101	E-4
Q1102	D-4
Q1103	E-3
Q1105	D-2
Q1106	F-3
Q1108	D-2
Q1109	G-3
Q1110	D-2
Q1111	D-1
Q1112	A-1
Q1113	B-2
Q1114	B-2
Q1115	C-3
VC1001	G-3
VC1002	G-2



SCHEMATIC DIAGRAM SP P.C.B. (E200E,E400E,E600E)

• SIGNAL PATH Y+C SIGNAL (GRAY) Y SIGNAL

SP P.C.B.



IC1007 IC1001 IC1002

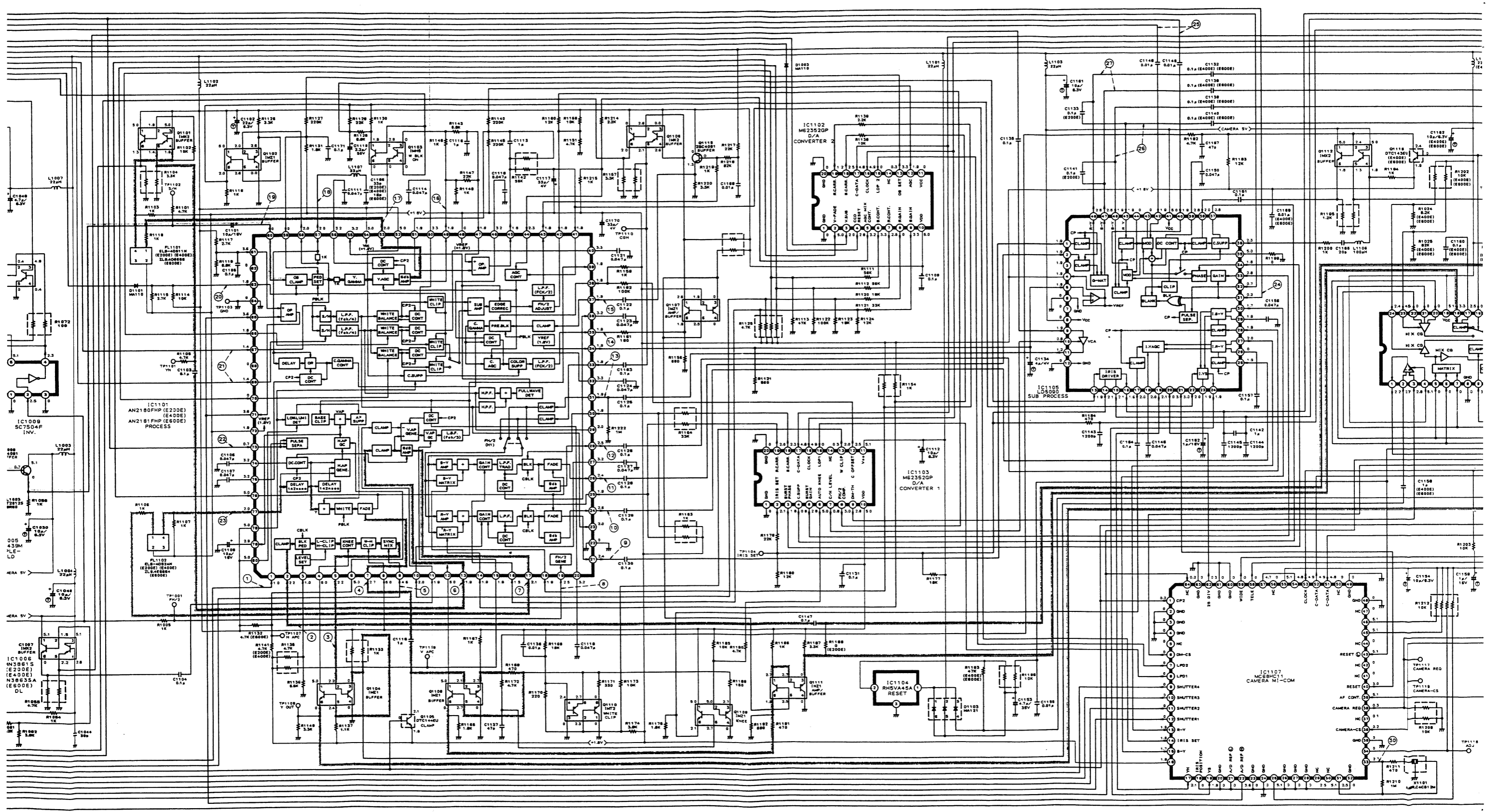
IC1004 IC1003

IC1005 IC1006 IC1008 IC1009

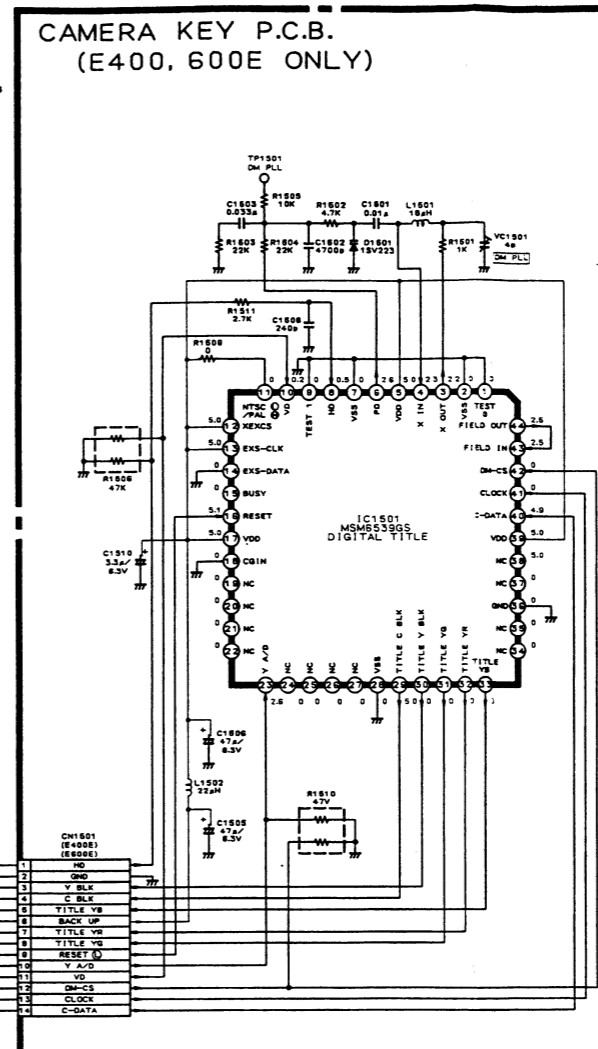
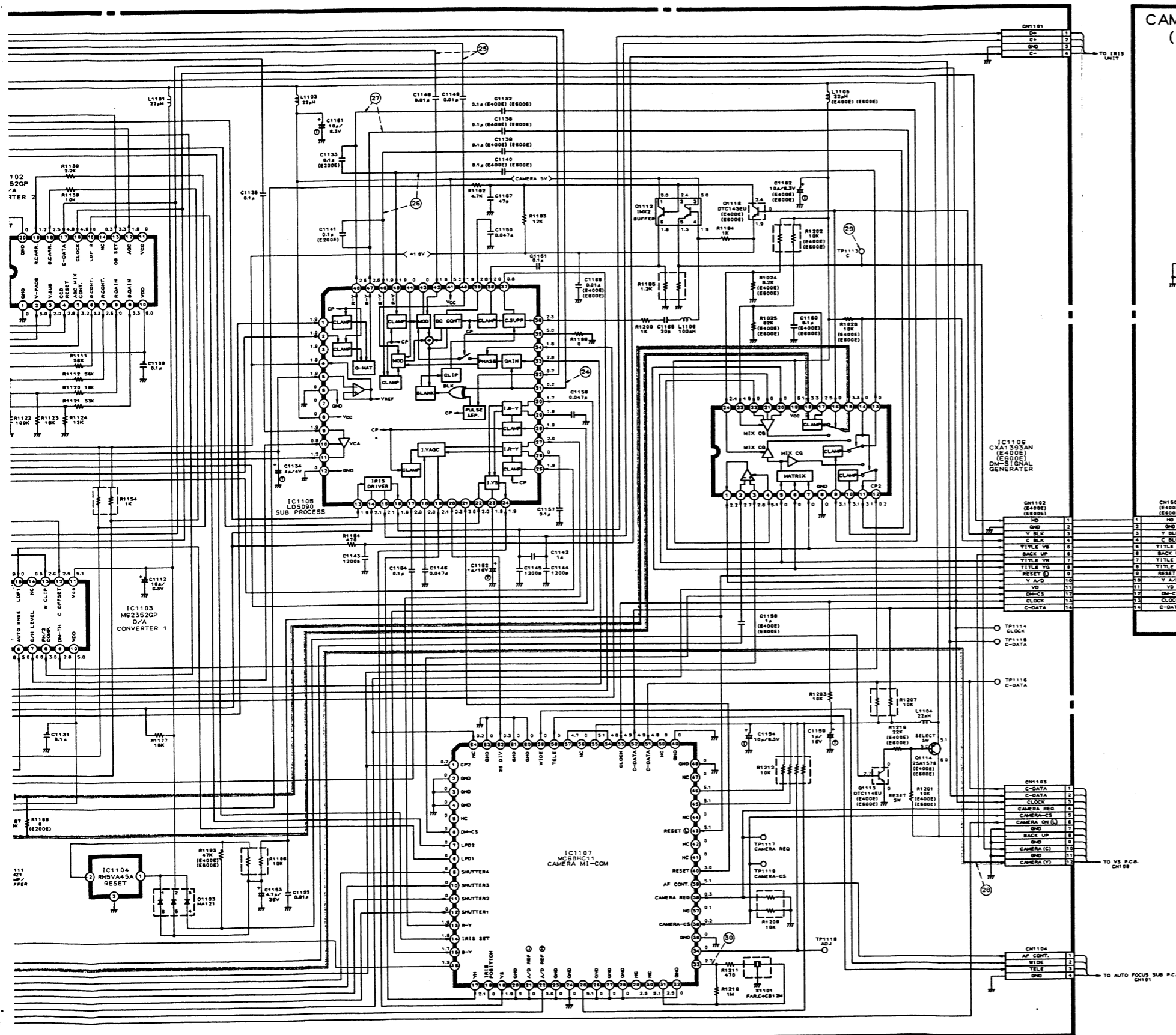
IC1101

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• SIGNAL PATH Y+C SIGNAL (GRAY) — Y SIGNAL (BLUE) C SIGNAL (ORANGE)



C1008	IC1009	IC1101	IC1103	IC1102	IC1104	IC1105	IC1107	IC1106
-------	--------	--------	--------	--------	--------	--------	--------	--------



03 IC1102 IC1104

IC1105

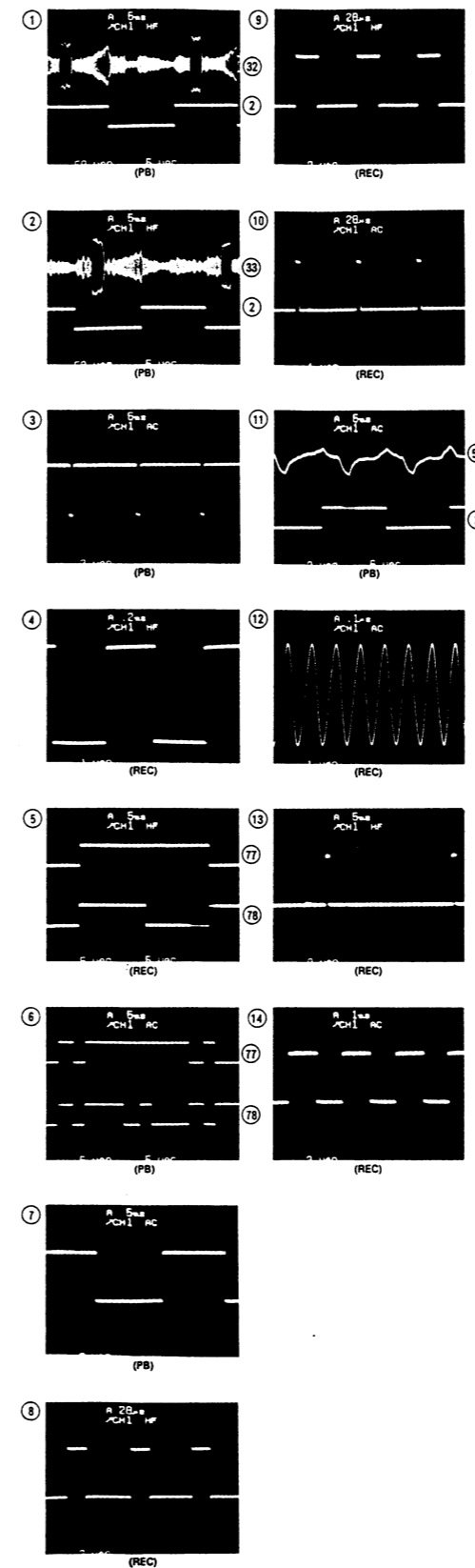
IC1107

IC1106

IC11501

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SIGNAL WAVEFORMS VS P.C.B. (SYSCON-SERVO SECTION)

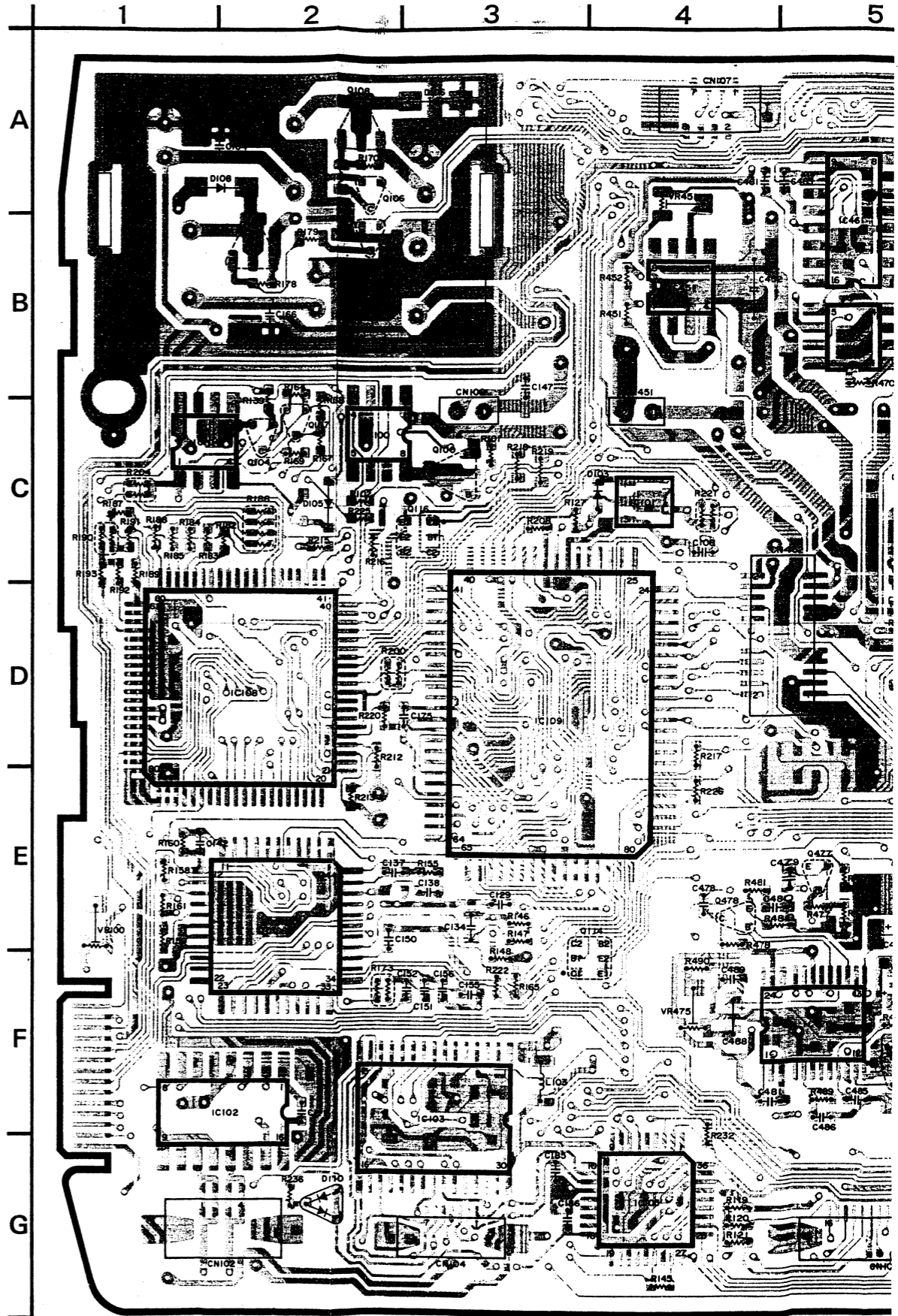


CIRCUIT BOARD DIAGRAM VS P.C.B.

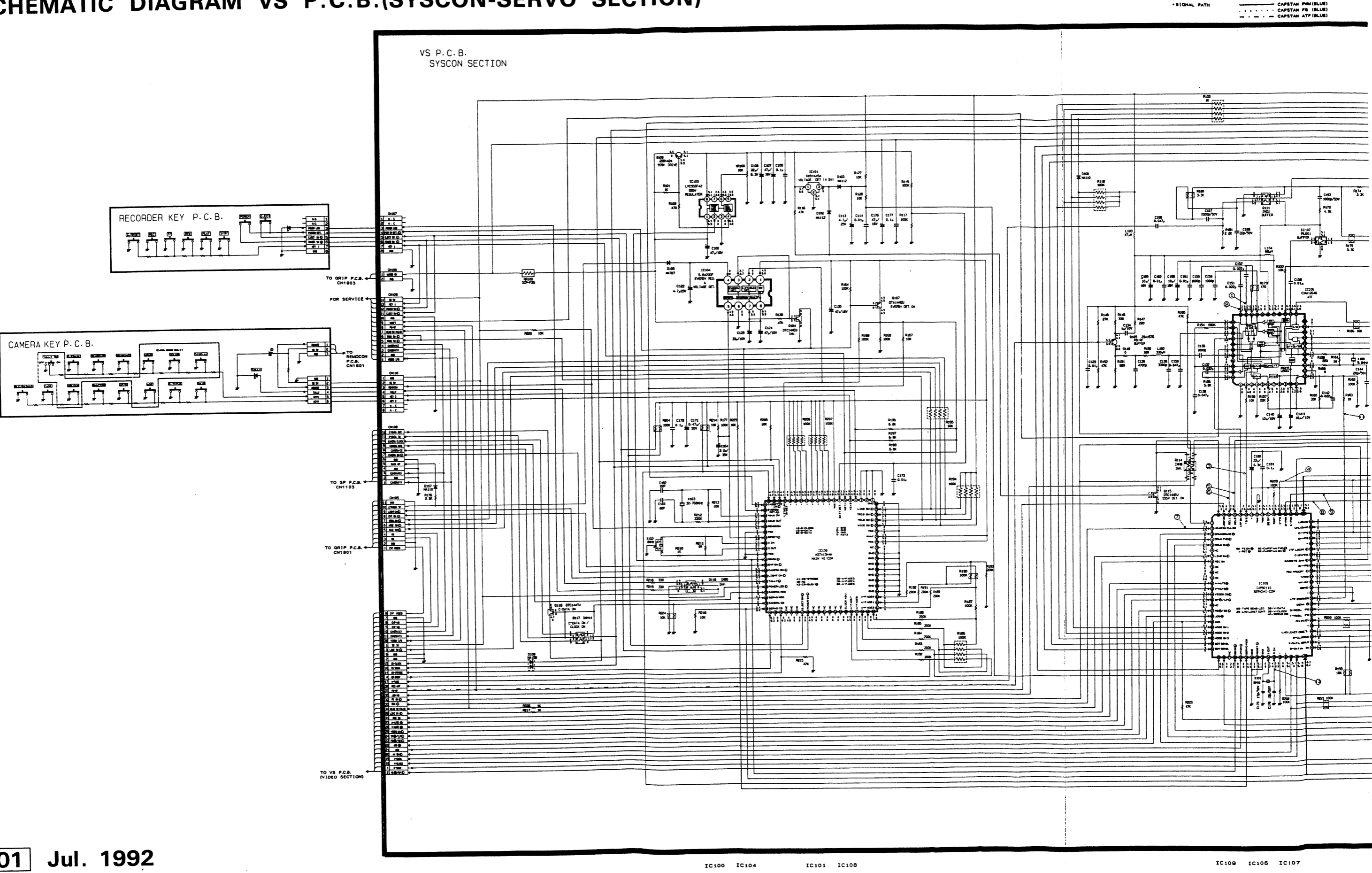
VS P.C.B. (SOLDERING SIDE)

< NOTICE >
VS P.C.B. consists of four layers.
(Soldering, Component, Power Supply and Ground patterns.)
※ Through-hole marks on each P.C.B. denote :
○ : Soldering side ↔ Component side
⊙ : Soldering side (Component side) ↔ Ground
⊕ : Soldering side (Component side) ↔ Power Supply
And, blue lines denote signal patterns which connected in the
Ground or Power Supply layer.
Blue (——) : Power Supply layer
Blue (----) : Ground layer

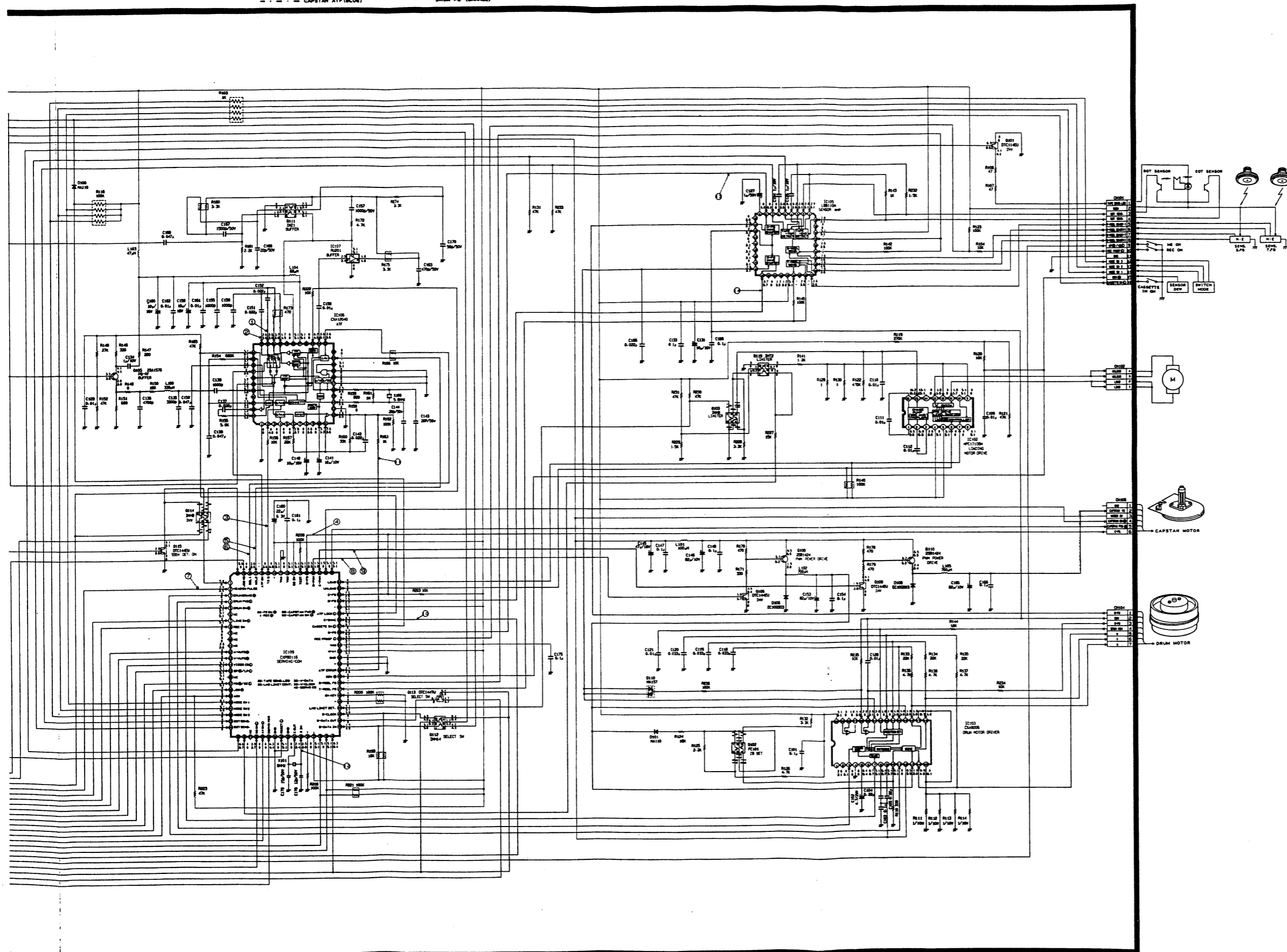
D103	C-4	Q673	E-8
D105	C-2	VC471	A-6
D106	A-3	VR100	E-1
D108	A-2	VR401	F-8
D110	G-2	VR402	E-9
D401	F-8	VR403	E-8
D402	F-9	VR404	F-8
D542	D-7	VR451	A-4
IC100	C-2	VR475	F-4
IC101	C-4	VR501	C-6
IC102	F-2	VR502	C-6
IC103	F-3	VR503	E-6
IC104	C-1	VR504	D-6
IC105	G-4	VR542	F-6
IC106	E-2	VR543	F-6
IC108	D-1	VR544	E-6
IC109	D-3	VR612	B-6
IC401	F-9		
IC451	B-4		
IC461	B-5		
IC462	B-5		
IC471	B-6		
IC476	F-5		
IC501	D-6		
IC612	B-8		
IC641	D-8		
Q100	C-3		
Q104	C-2		
Q106	A-2		
Q107	C-2		
Q108	A-2		
Q109	B-2		
Q110	B-2		
Q114	E-4		
Q116	C-3		
Q408	D-9		
Q477	E-5		
Q478	E-4		
Q481	F-5		
Q544	E-7		
Q545	E-7		
Q546	E-7		
Q547	E-7		
Q548	F-7		
Q549	E-7		
Q570	F-7		
Q571	F-6		
Q572	F-6		
Q589	F-7		
Q590	G-7		
Q596	E-5		
Q612	B-7		
Q613	B-7		
Q614	A-7		
Q644	C-8		
Q672	E-9		



SCHEMATIC DIAGRAM VS P.C.B.(SYSCON-SERVO SECTION)



- SIGNAL PATH
 CAPSTAN PFM (BLUE)
 CAPSTAN FB (BLUE)
 CAPSTAN ATF (BLUE)
 DRUM PFM (ORANGE)
 DRUM FB (ORANGE)
 DRUM PS (ORANGE)



IC105 IC106 IC107

IC105

IC103 IC102

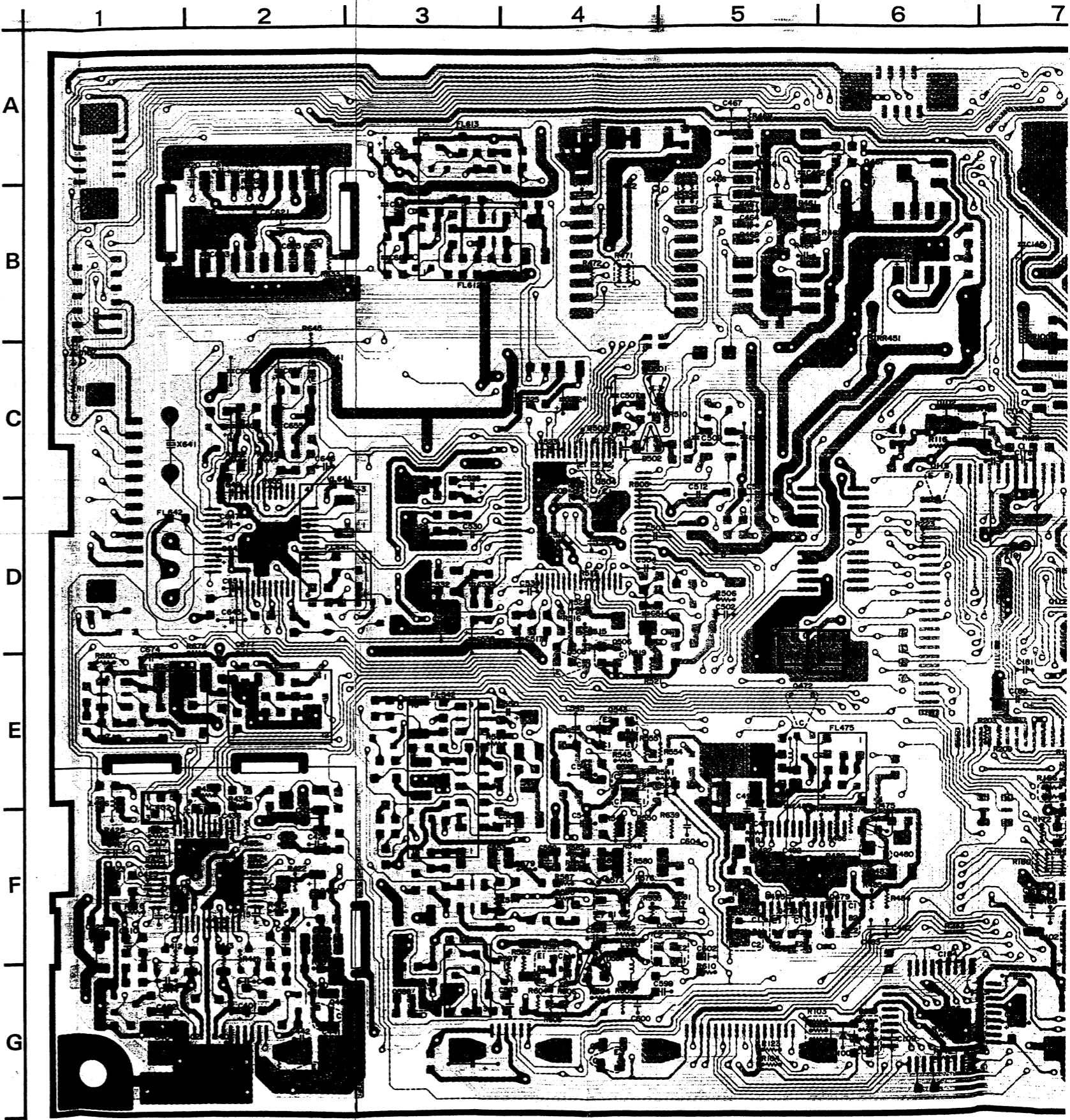
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 IV-11

CIRCUIT BOARD DIAGRAM VS P.C.B.

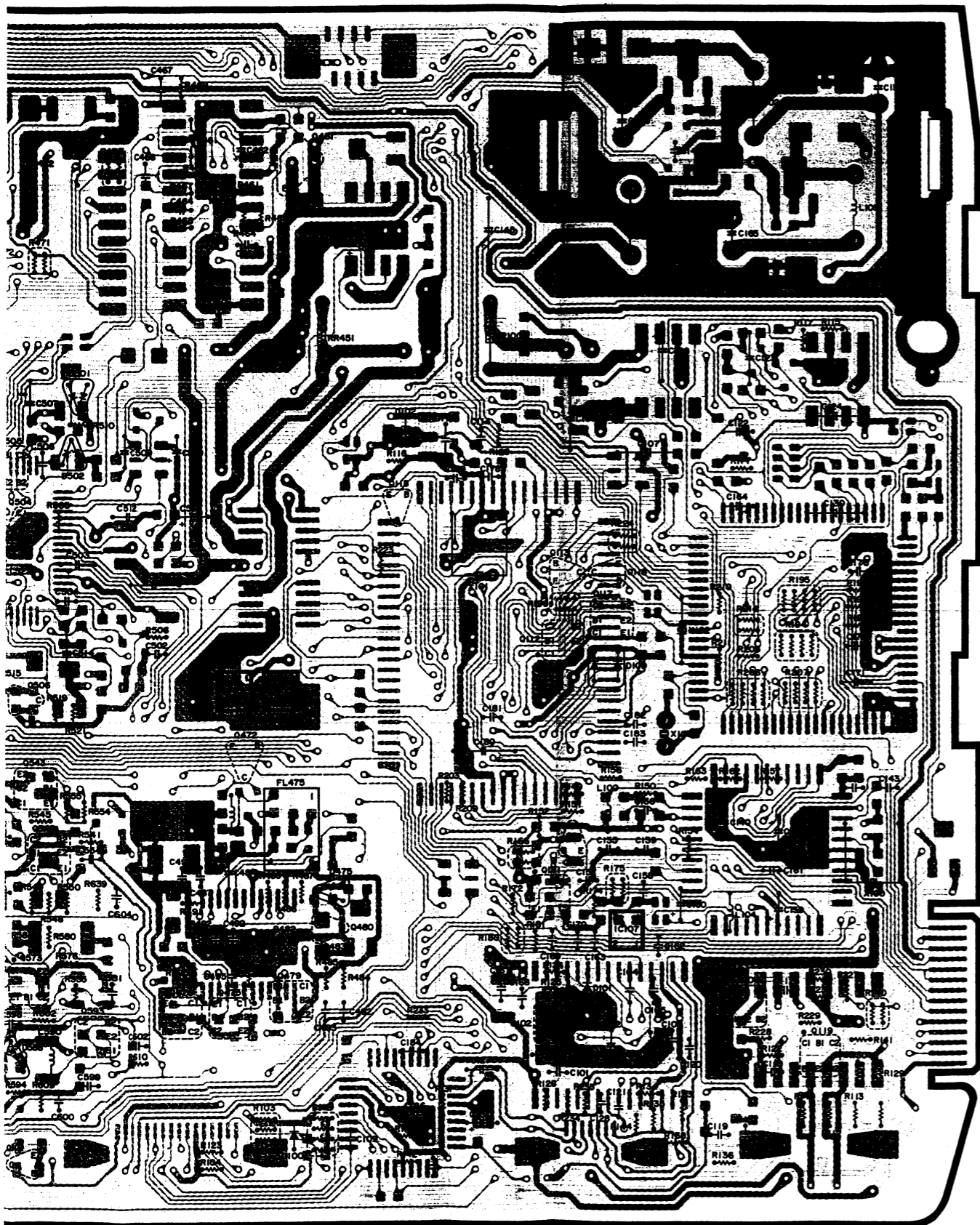
VS P.C.B. (COMPONENT SIDE)

< NOTICE >
VS P.C.B. consists of four layers.
(Soldering, Component, Power Supply and Ground patterns.)
※ Through-hole marks on each P.C.B. denote :
○ : Soldering side ↔ Component side
Ⓒ : Soldering side (Component side) ↔ Ground
Ⓑ : Soldering side (Component side) ↔ Power Supply
And, blue lines denote signal patterns which connected in the
Ground or Power Supply layer.
Blue (——) : Power Supply layer
Blue (----) : Ground layer

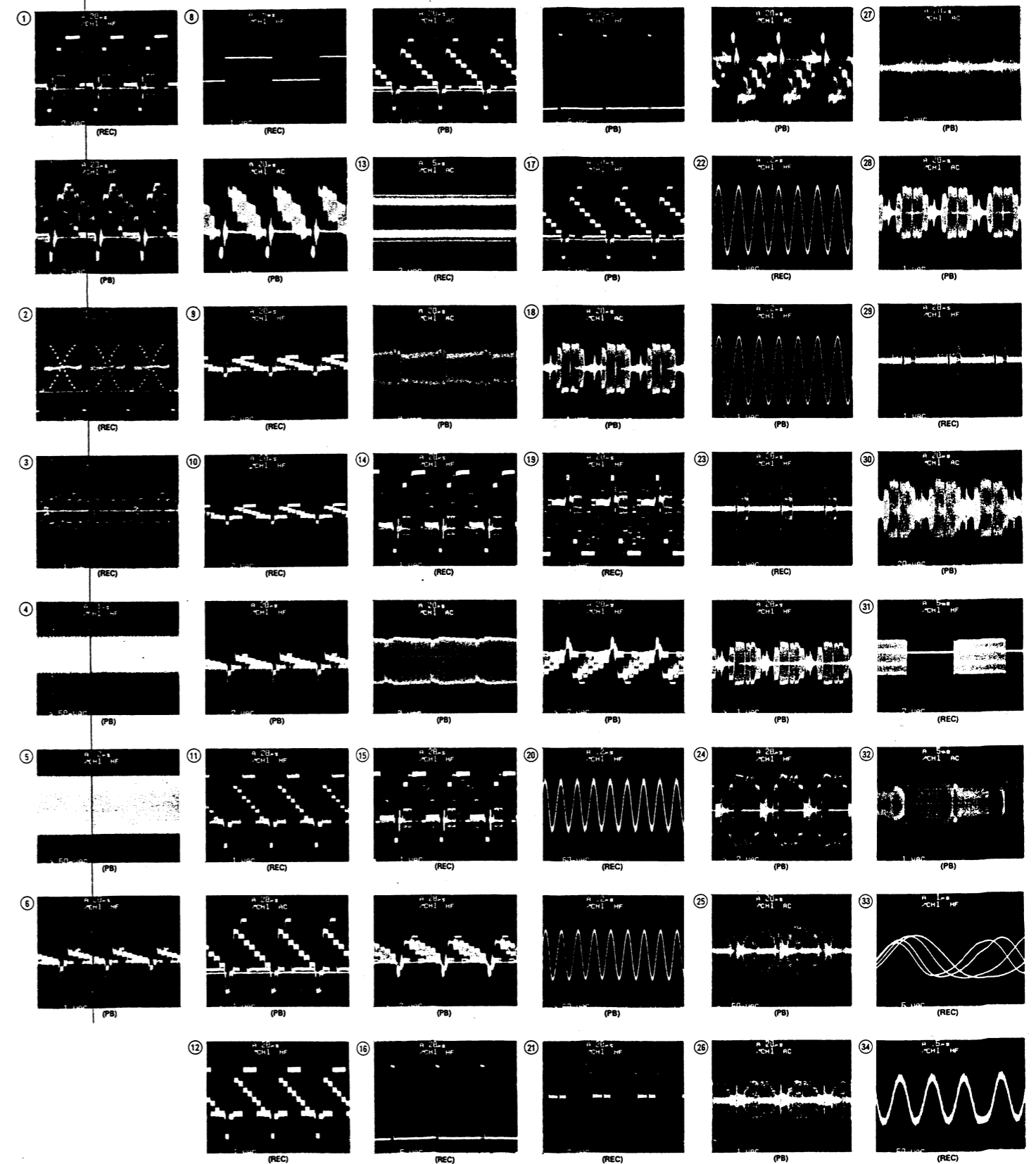
D100	G-6
D101	F-7
D102	C-6
D107	C-1
D109	D-7
D475	F-6
D501	C-5
D502	C-4
D588	G-4
IC107	F-7
IC402	F-1
IC452	D-5
IC453	D-6
Q101	G-4
Q102	F-7
Q103	F-8
Q105	E-7
Q111	F-7
Q112	D-7
Q113	D-7
Q115	C-6
Q117	D-7
Q118	D-7
Q119	F-9
Q405	F-1
Q406	G-2
Q407	G-2
Q451	A-6
Q472	E-5
Q475	F-5
Q476	F-5
Q479	F-6
Q480	F-6
Q504	D-4
Q505	C-4
Q506	D-4
Q508	E-4
Q542	E-4
Q543	E-4
Q573	F-4
Q588	G-3
Q591	F-4
Q593	F-5
Q641	C-2



5 6 7 8 9

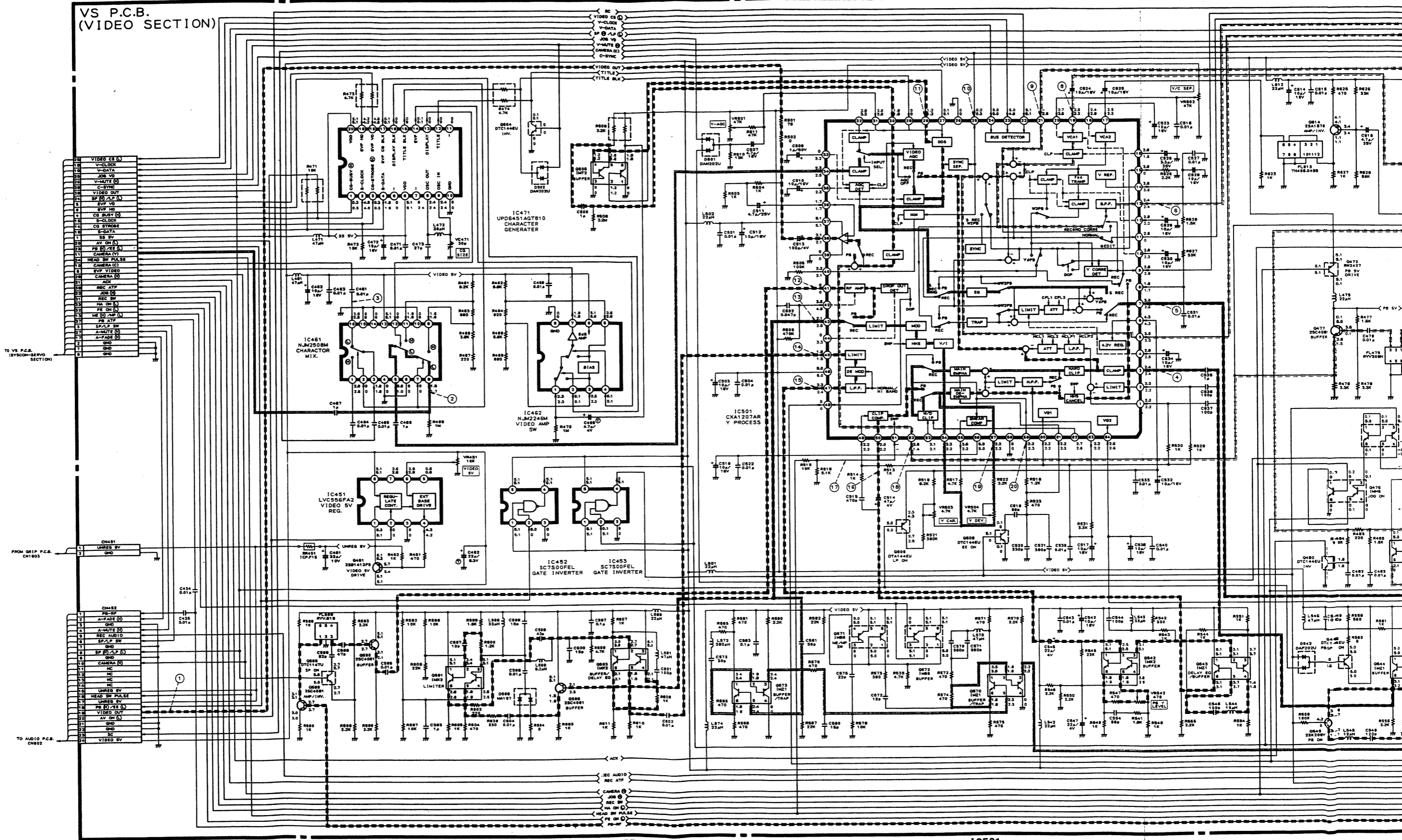


SIGNAL WAVEFORMS VS P.C.B. (VIDEO SECTION)



SCHEMATIC DIAGRAM VS P.C.B.(VIDEO SECTION)

○ SIGNAL PATH — REC Y+C (GRAY) — REC Y (BLUE) — REC C (ORANGE)
— PB Y+C (GRAY) — PB Y (BLUE) — PB C (ORANGE)

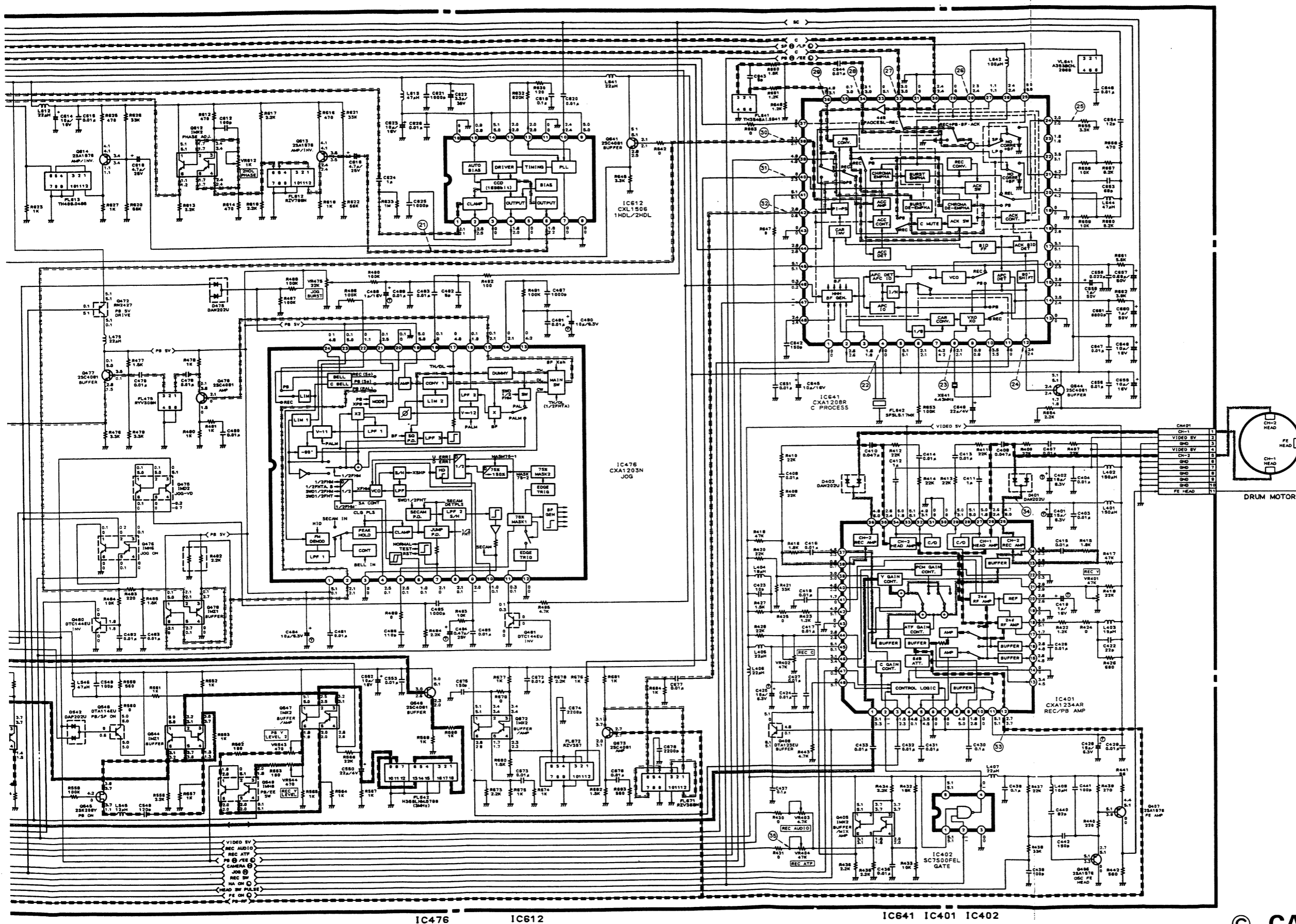


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IC471 IC481 IC451

IC452 IC462 IC453

IC501



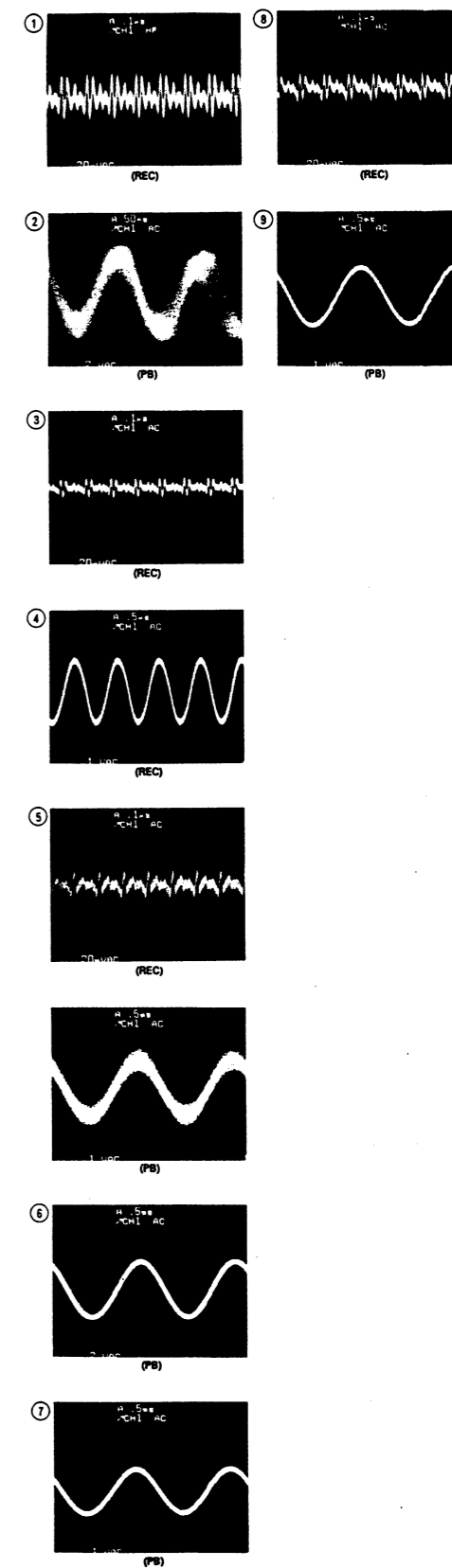
IC476

IC612

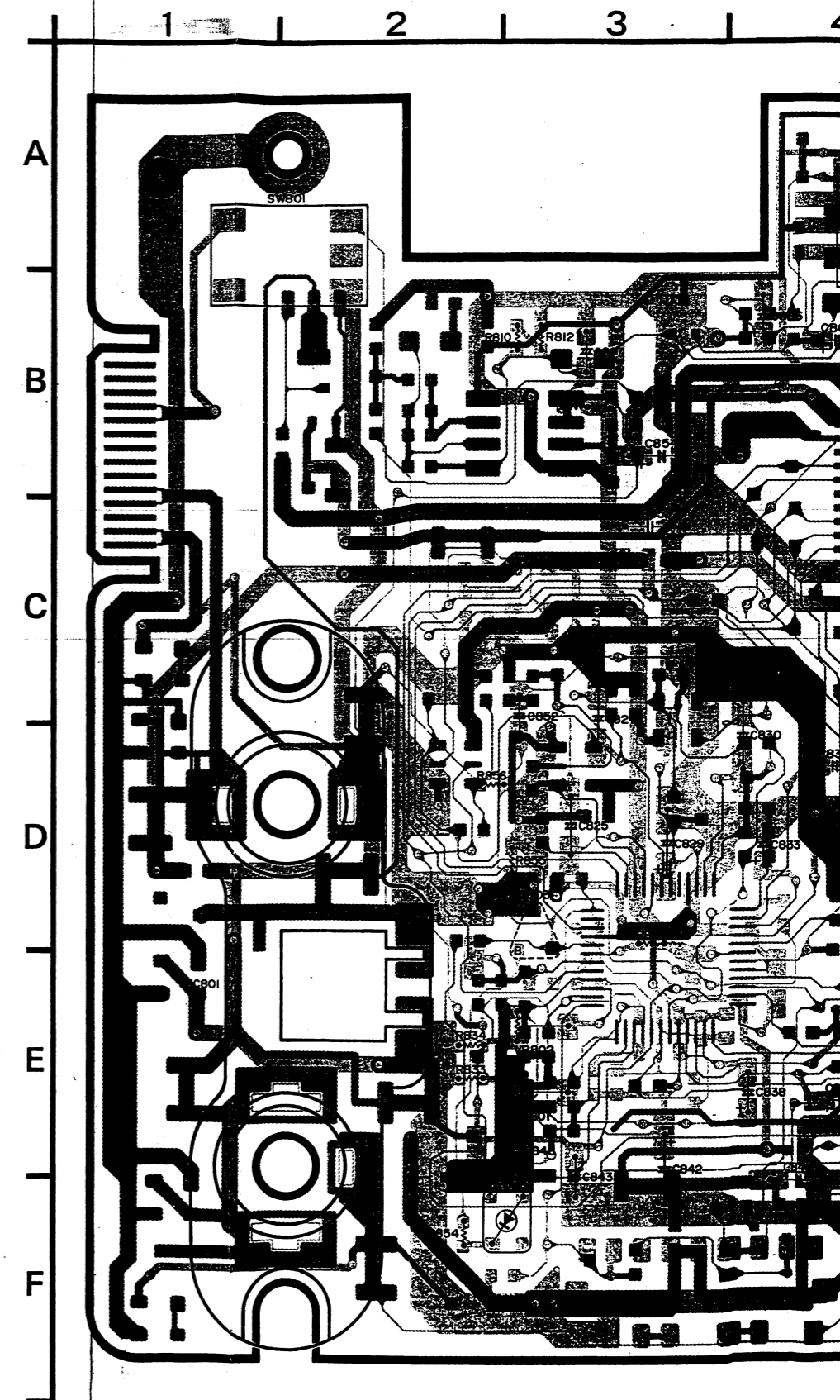
IC641 IC401 IC402

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IV-13

SIGNAL WAVEFORMS AUDIO P.C.B. (E200E, E400E)



Q 8 0 3	D - 3
VR 8 0 1	E - 3
VR 8 0 2	E - 3

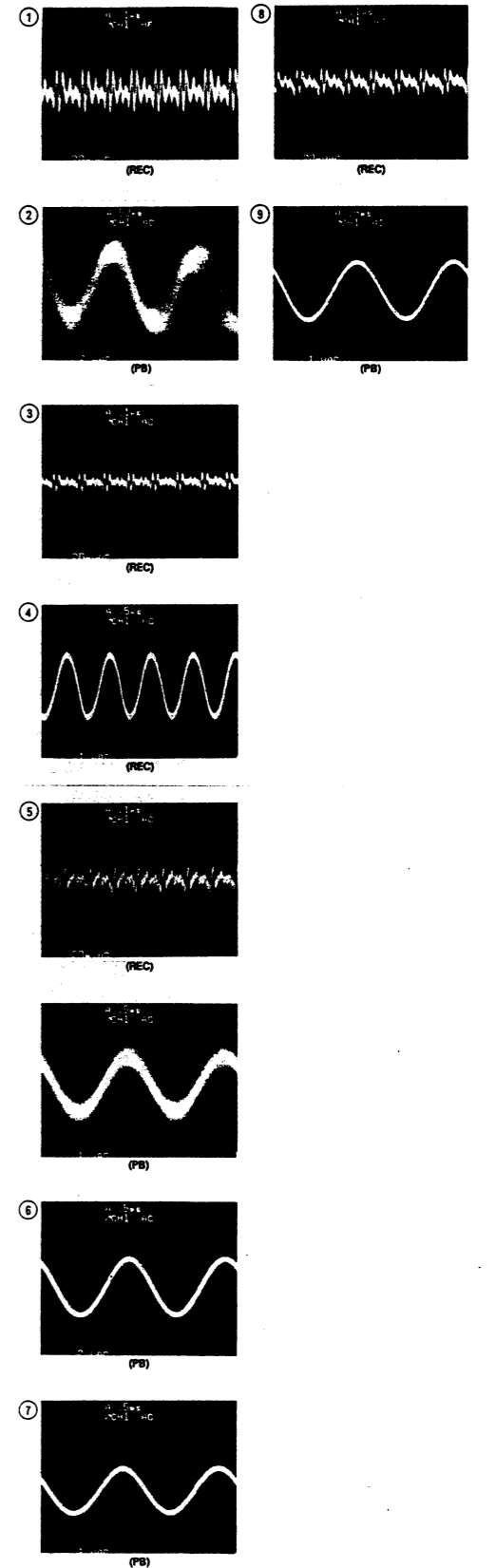


B.. (E200E, E400E)

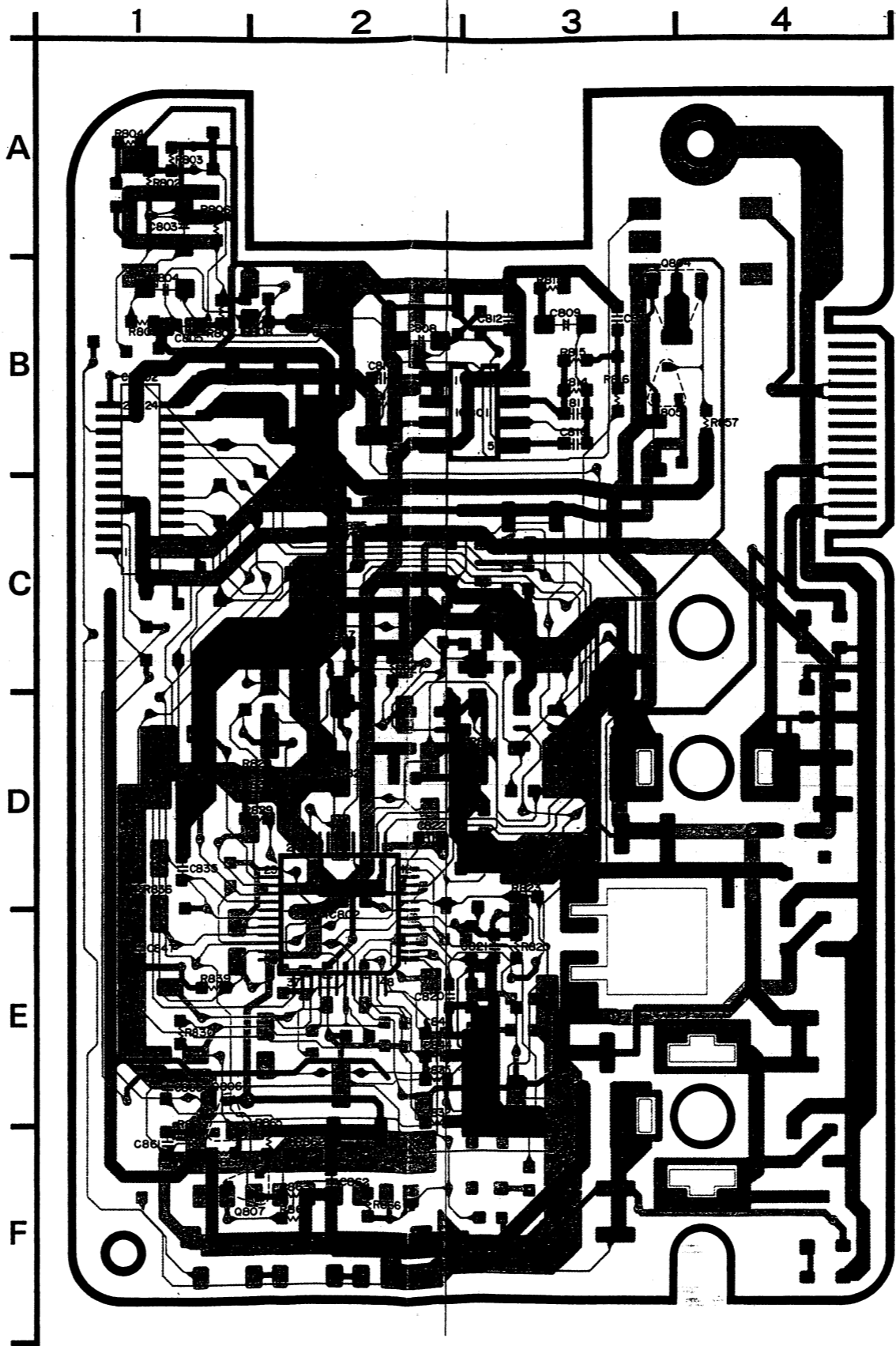
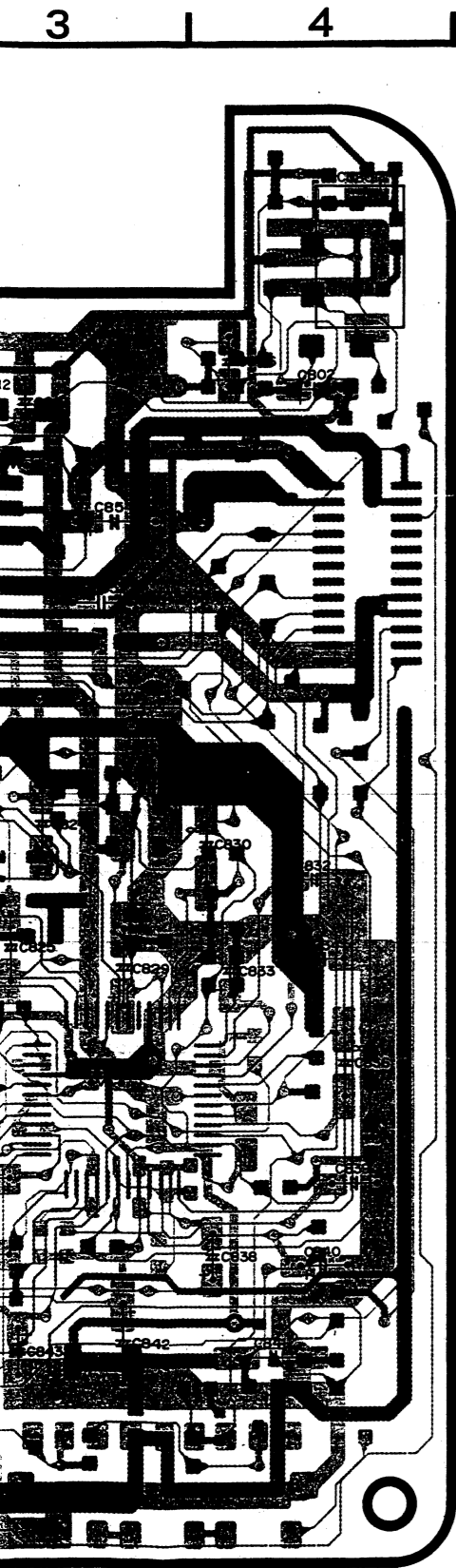
AUDIO P.C.B. (SOLDERING SIDE)

IC801	B-3
IC802	D-2
Q801	B-2
Q804	B-3
Q805	B-3
Q806	E-1
Q807	F-1

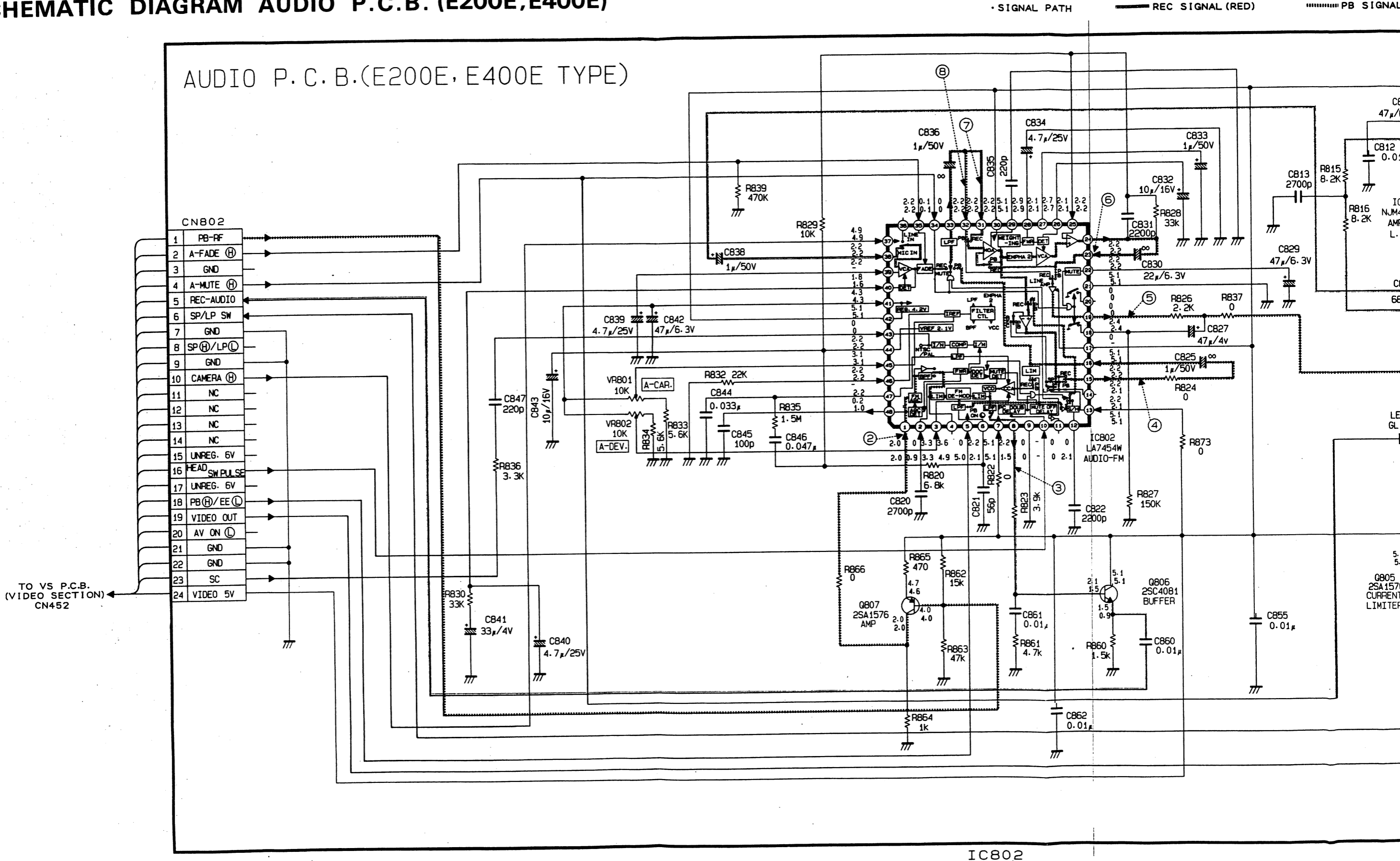
SIGNAL WAVEFORMS
AUDIO P.C.B. (E200E, E400E)



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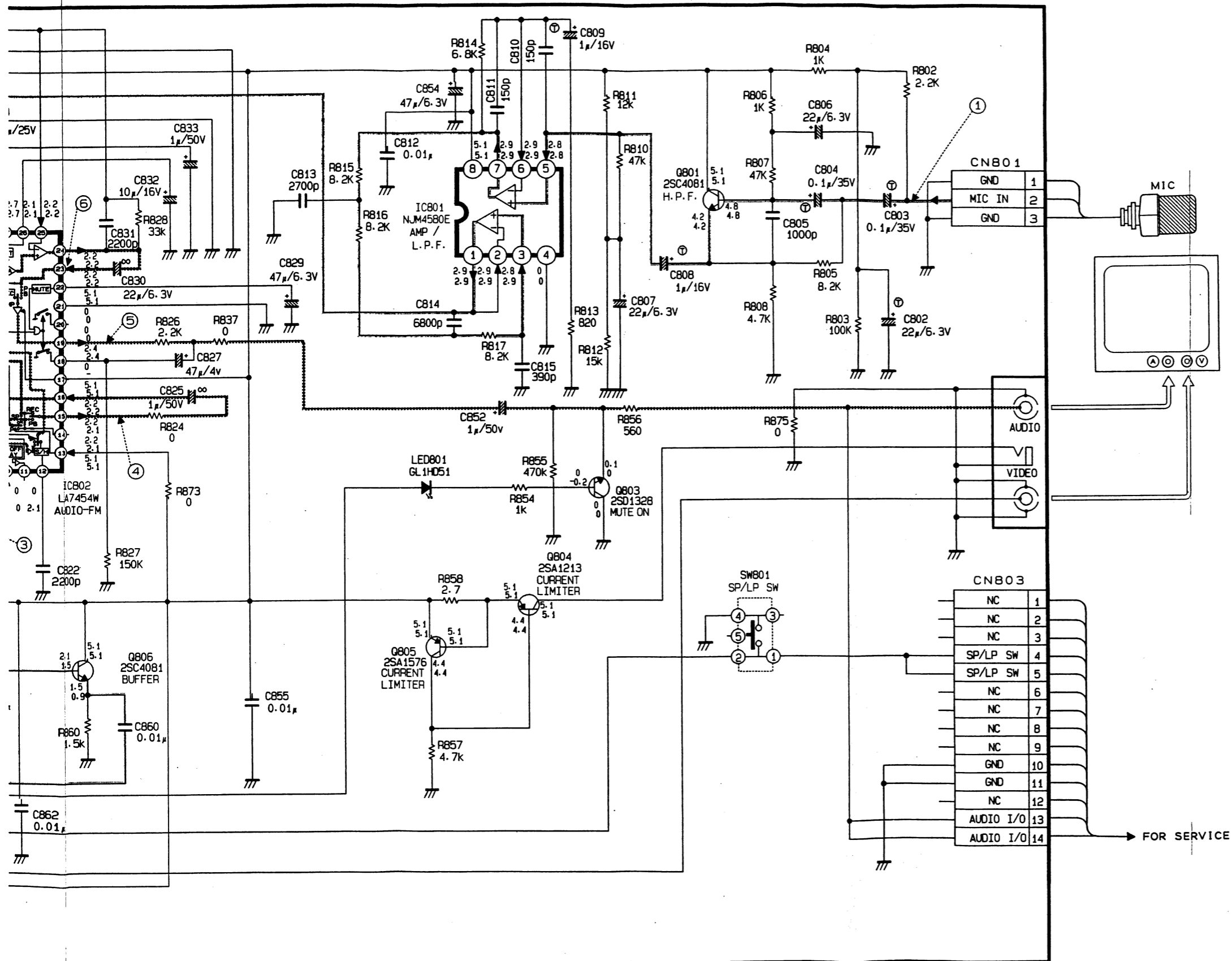
SCHEMATIC DIAGRAM AUDIO P.C.B. (E200E,E400E)



PATH

— REC SIGNAL (RED)

..... PB SIGNAL (RED)

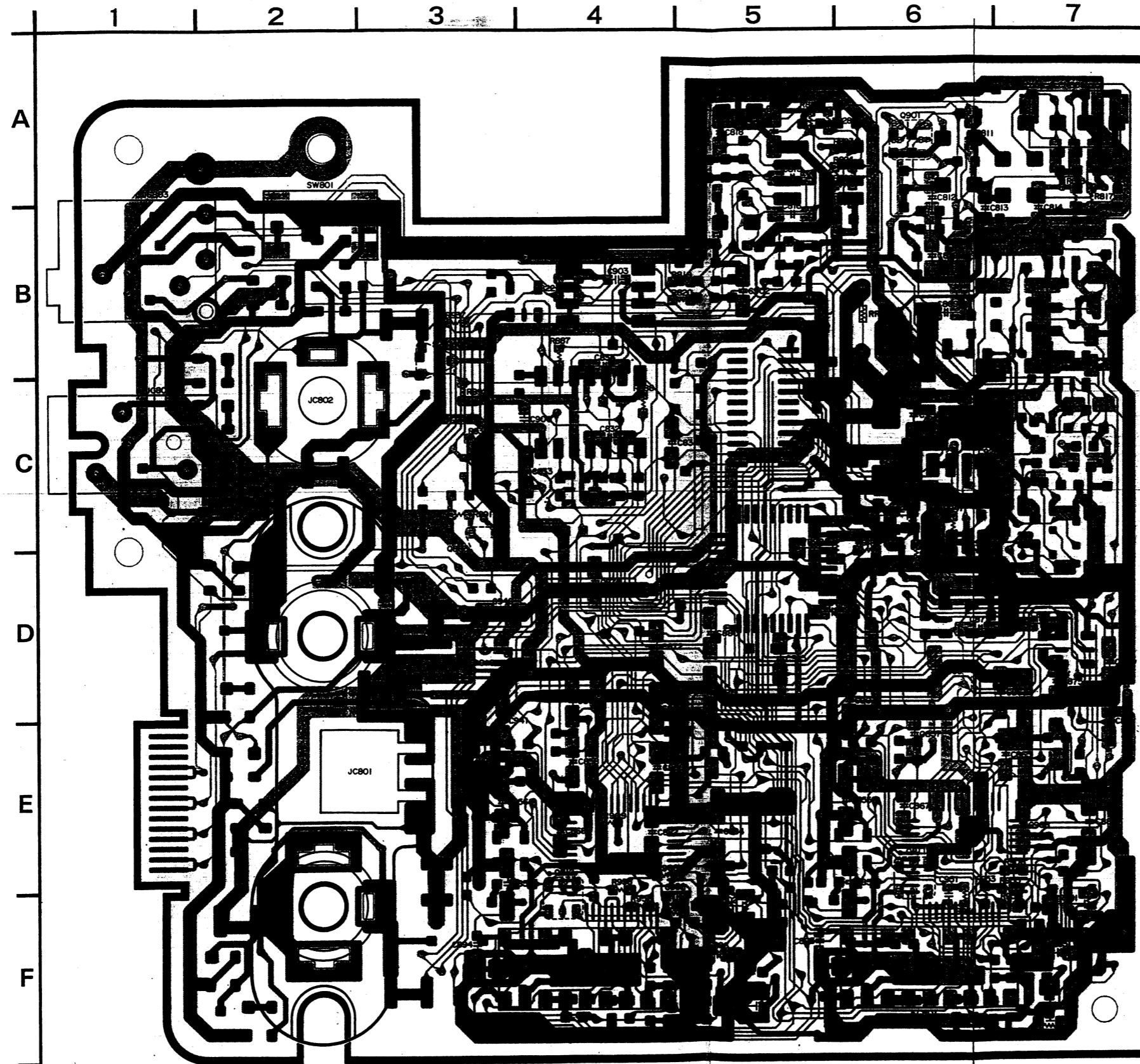


IC801

CIRCUIT BOARD DIAGRAM AUDIO P.C.B. (E600E)

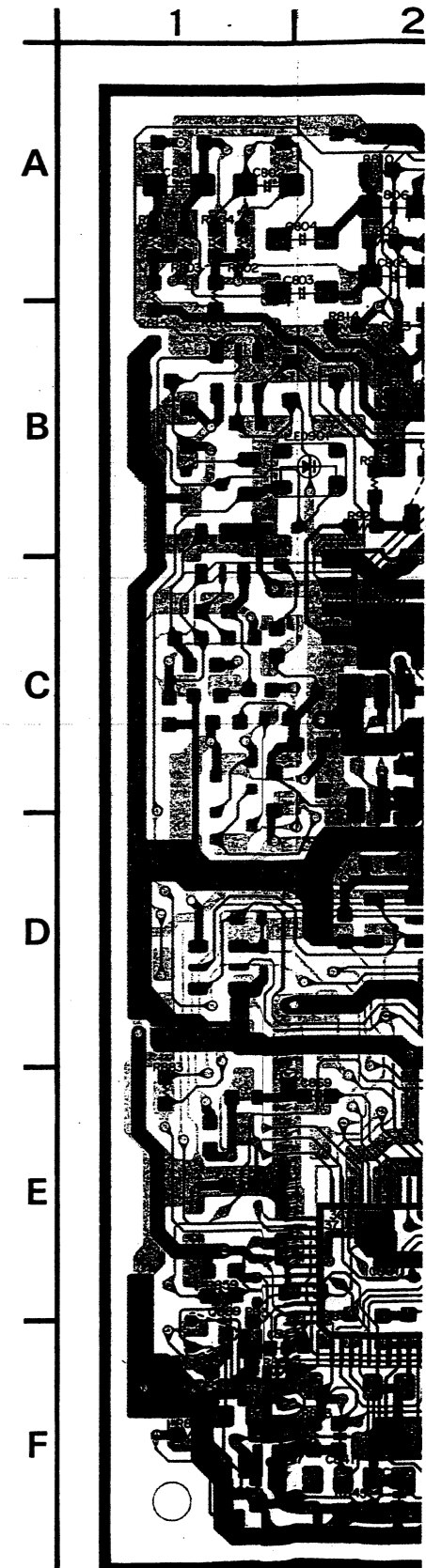
AUDIO P.C.B. (COMPONENT SIDE)

IC910	D-3
Q803	C-3
Q804	B-3
Q811	E-6
Q812	E-4
Q901	A-6
VR801	F-7
VR802	F-5
VR803	F-7
VR804	F-5
VR901	C-5
VR902	C-6



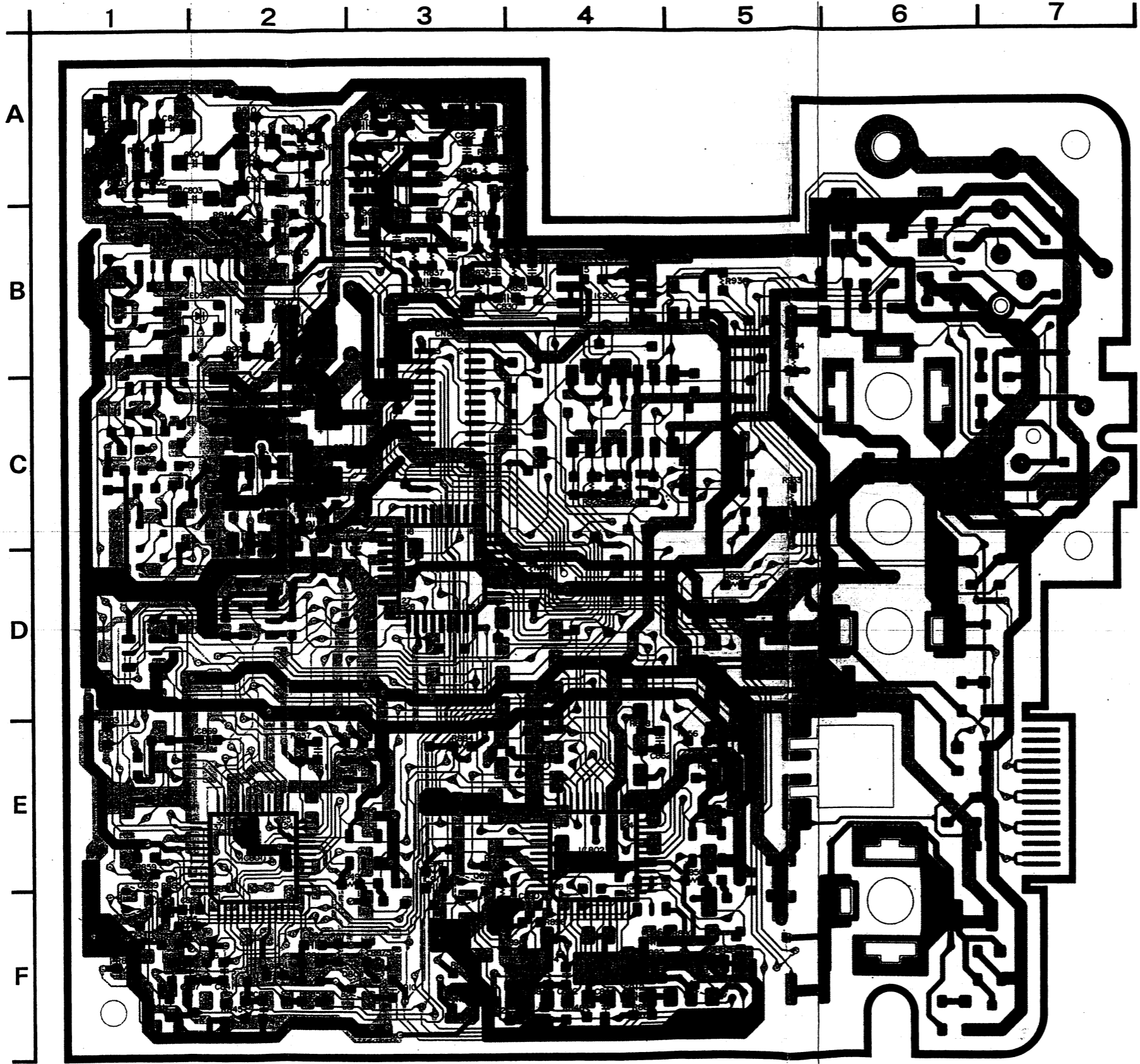
AUDIO P.C.B. (SOLDERING SIDE)

IC801	E-2
IC802	E-4
IC901	A-3
IC903	D-3
IC906	B-5
IC907	C-2
Q801	F-2
Q802	F-5
Q809	F-1
Q810	F-3
Q904	D-2
Q907	B-2

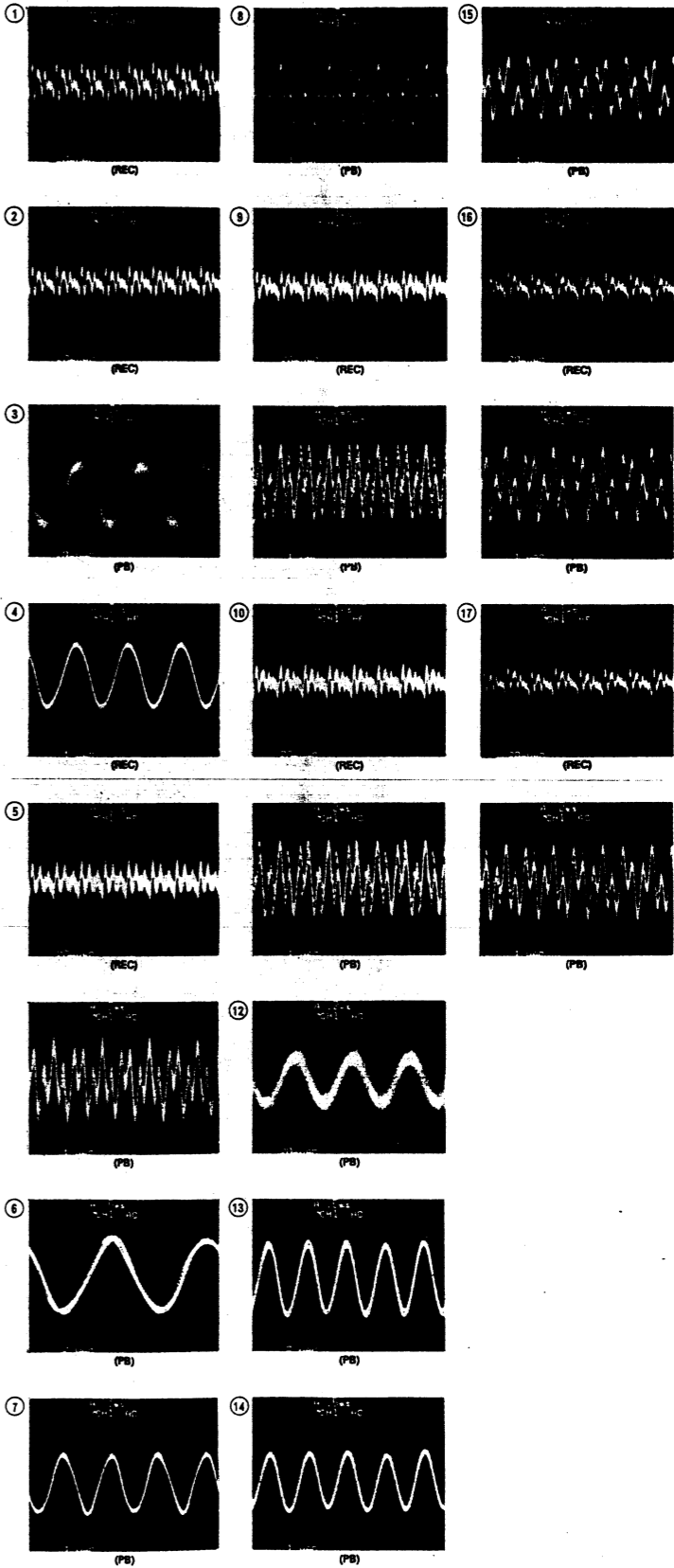


AUDIO P.C.B. (SOLDERING SIDE)

IC801	E-2
IC802	E-4
IC901	A-3
IC903	D-3
IC906	B-5
IC907	C-2
Q801	F-2
Q802	F-5
Q809	F-1
Q810	F-3
Q904	D-2
Q907	B-2

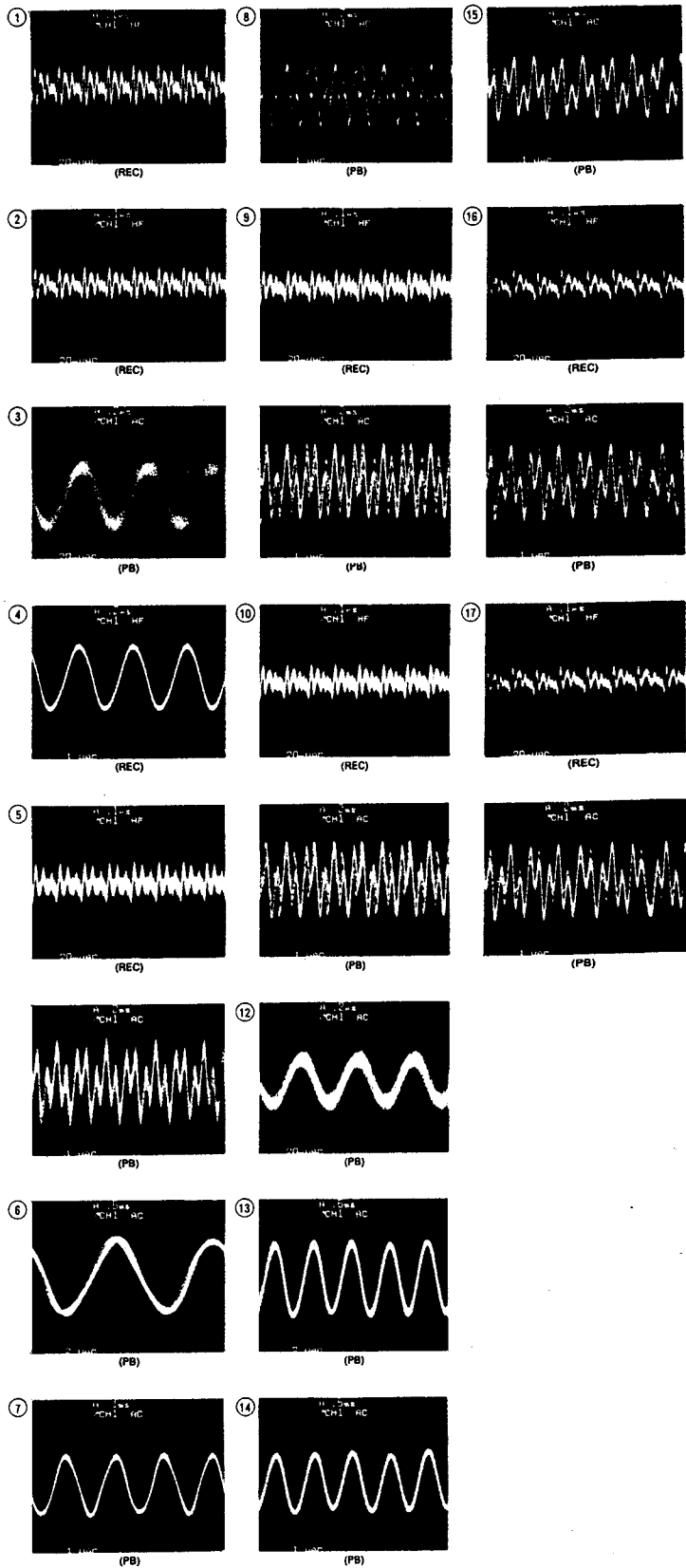


SIGNAL WAVEFORMS
AUDIO P.C.B. (E600E)



SIGNAL WAVEFORMS

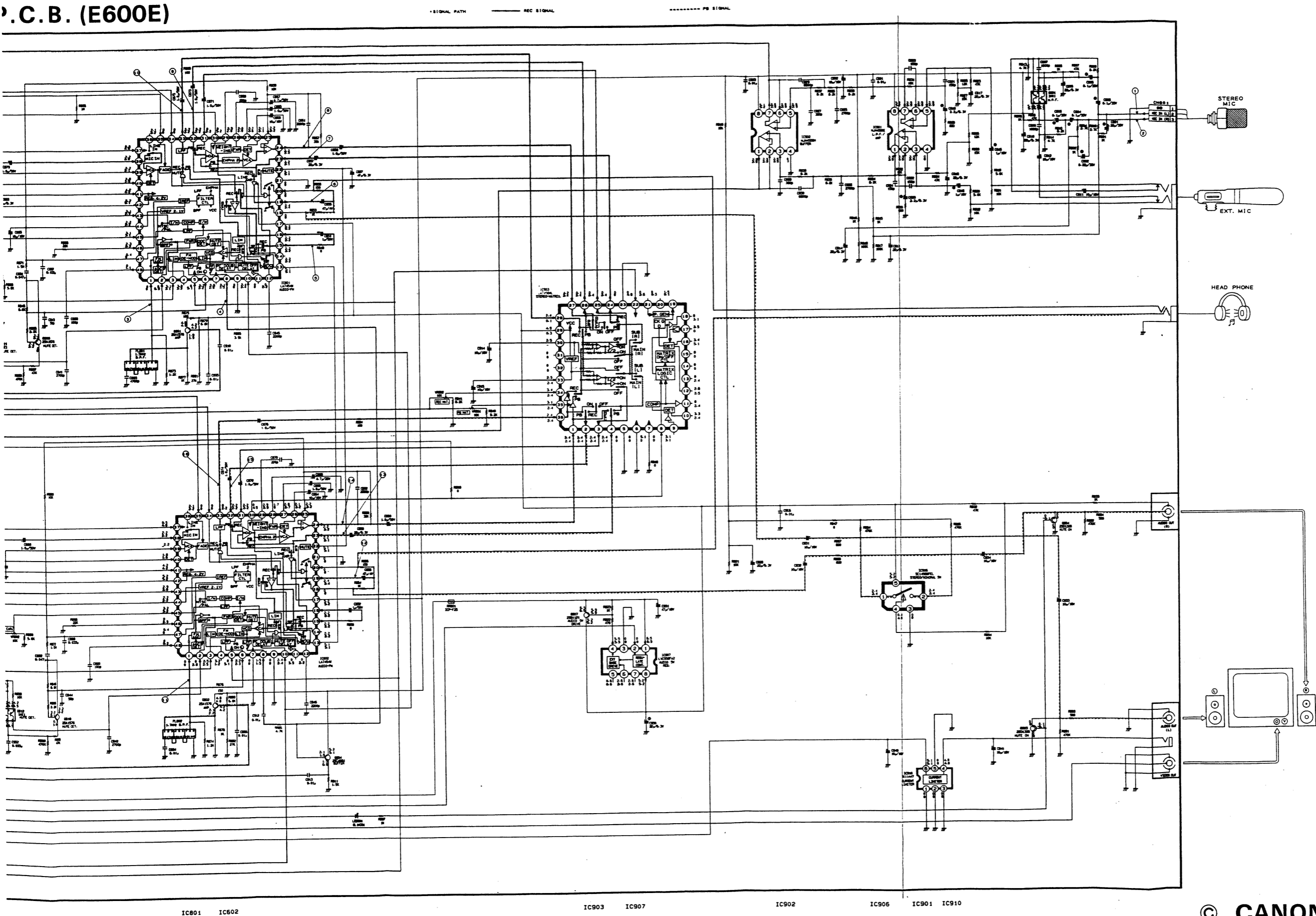
AUDIO P.C.B. (E600E)



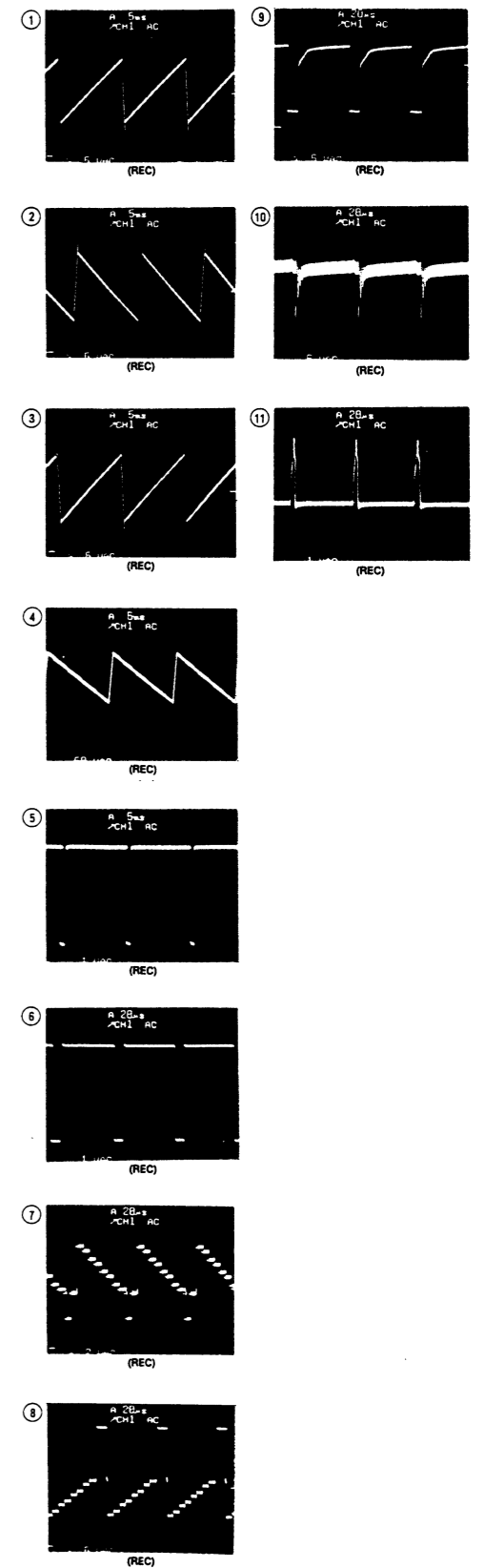
01



P.C.B. (E600E)

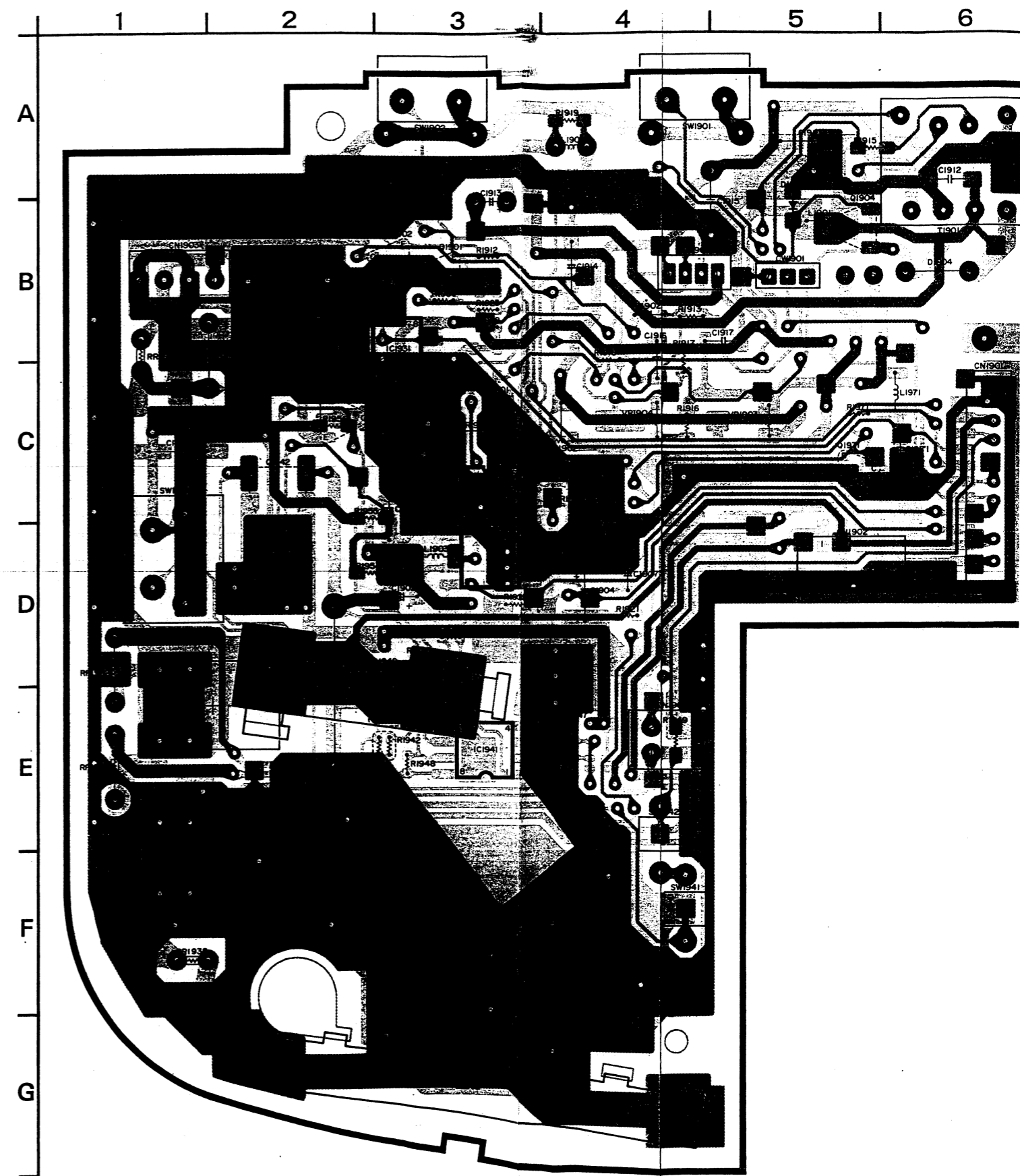


SIGNAL WAVEFORMS



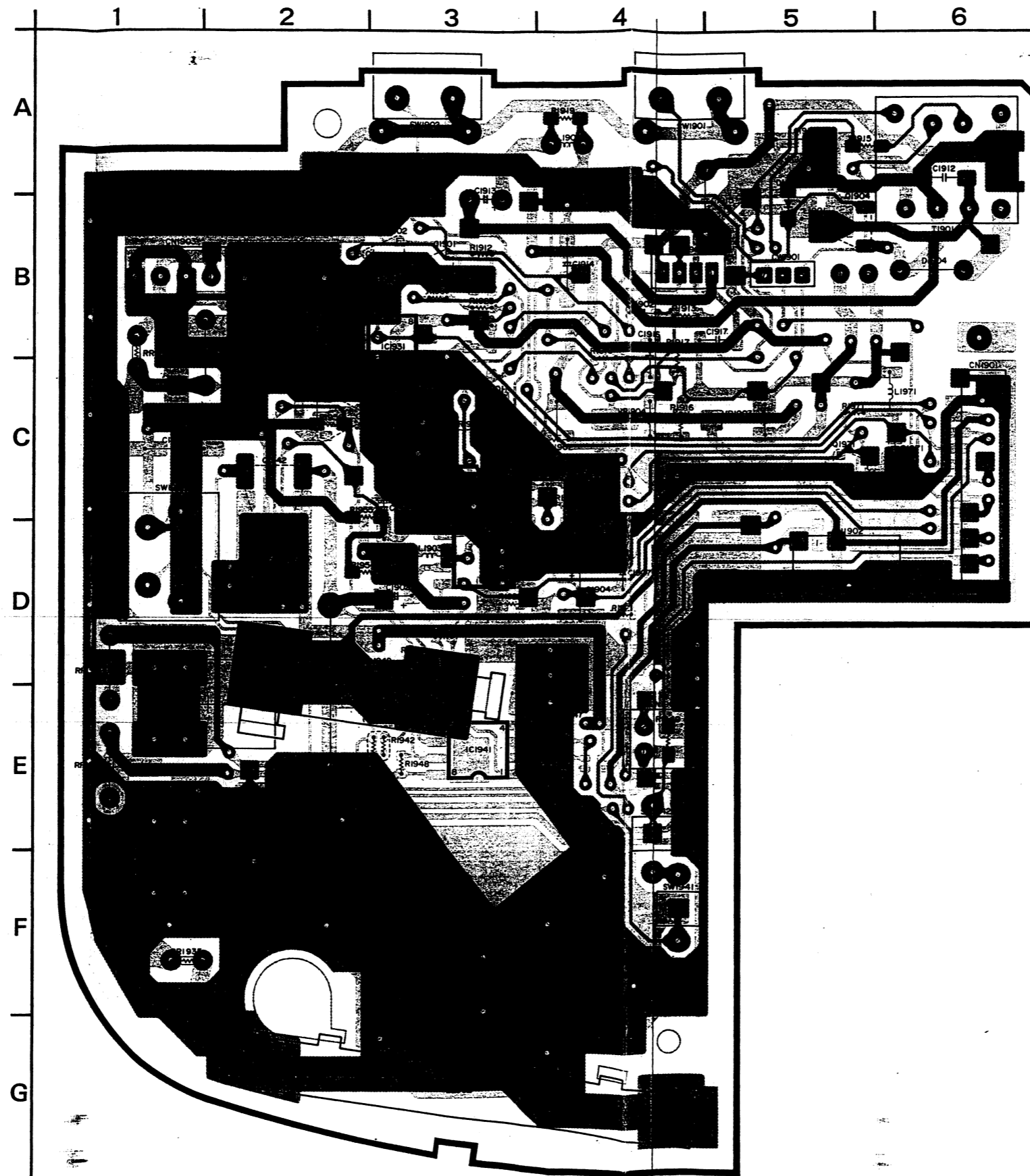
CIRCUIT BOARD DIAGRAM GRIP P.C.B.

D1902	B-4
D1903	B-5
D1904	B-6
D1942	D-3
IC1901	D-3
IC1931	B-3
IC1941	E-3
Q1901	B-3
Q1902	B-3
Q1904	B-5
Q1931	C-2
Q1942	C-2
Q1943	E-3
Q1944	D-2
Q1971	C-5
VR1901	C-3
VR1902	C-4
VR1903	C-5
VR1904	C-4

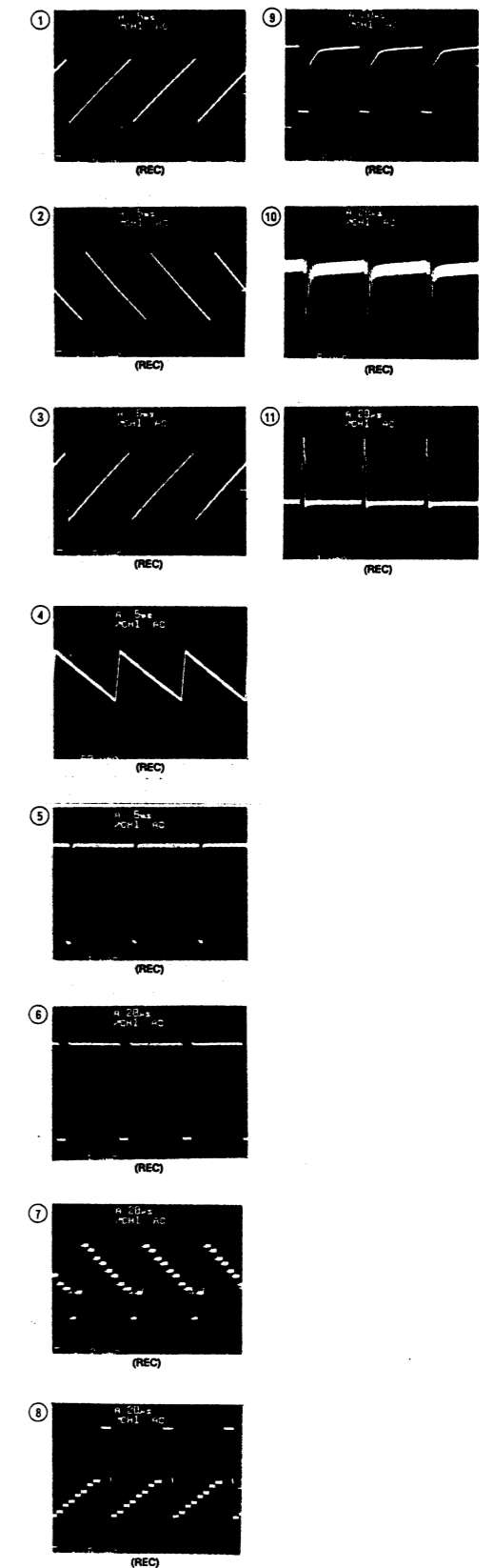


CIRCUIT BOARD DIAGRAM GRIP P.C.B.

D1902	B-4
D1903	B-5
D1904	B-6
D1942	D-3
IC1901	D-3
IC1931	B-3
IC1941	E-3
Q1901	B-3
Q1902	B-3
Q1904	B-5
Q1931	C-2
Q1942	C-2
Q1943	E-3
Q1944	D-2
Q1971	C-5
VR1901	C-3
VR1902	C-4
VR1903	C-5
VR1904	C-4

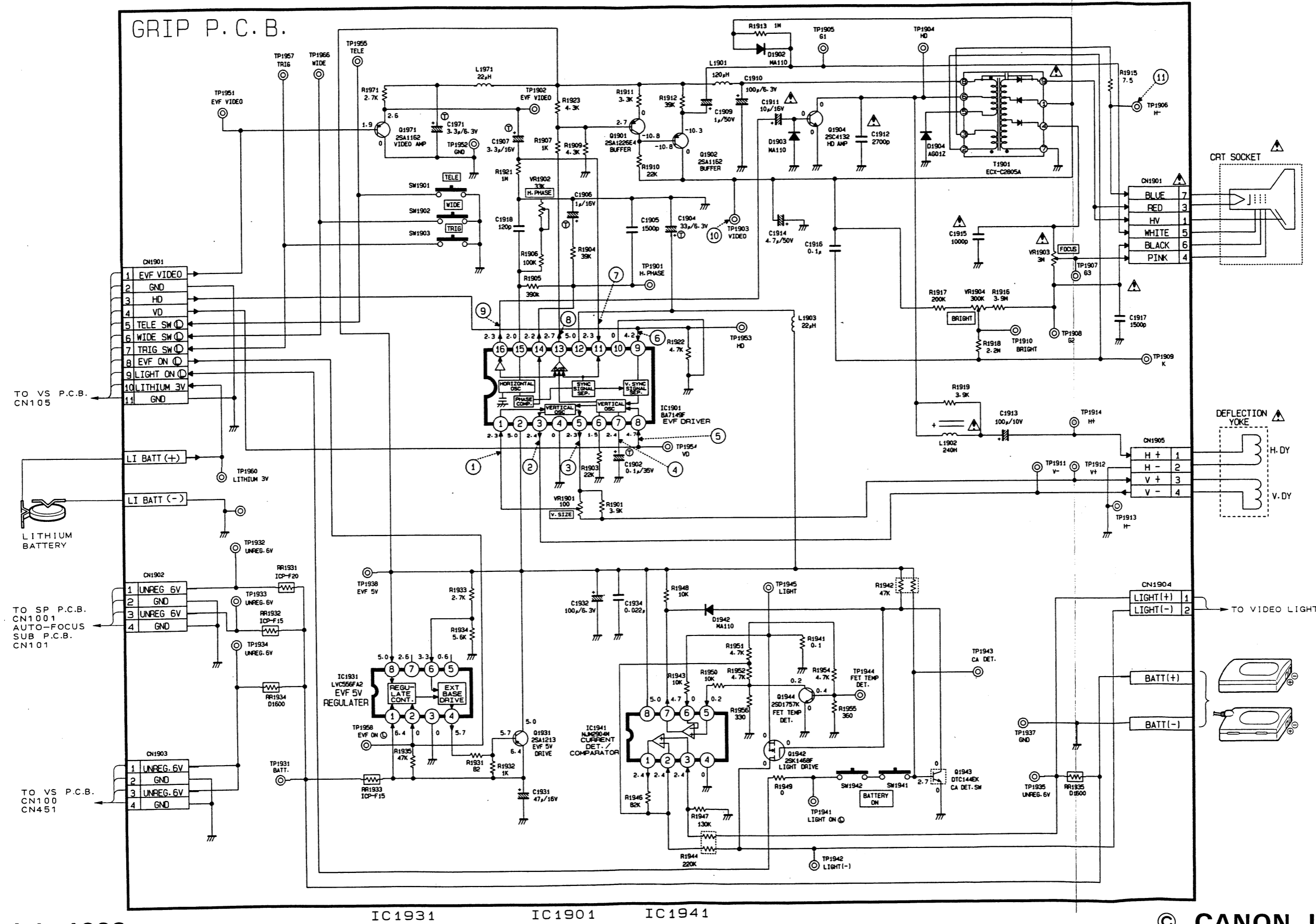


SIGNAL WAVEFORMS



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SCHEMATIC DIAGRAM GRIP P.C.B.



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